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THE Albany Medical Annals

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JANUARY, 1895.

\$1.00 A YEAR.

Contribution to the Study of Serum-Therapy in Diphtheria.*

BY E. ROUX, M. D.,

Chief of Laboratory of the Pasteur Institute,
and

DRS. L. MARTIN AND A. CHAILLOU,

Internes of the Hospitals of Paris.

Serum-therapy is one of the most important questions of the day since the researches of Behring and Kitasato. Tetanic antitoxine was studied first, as being the easiest to obtain and because its preventive action is manifested with a marvelous potency. In practice it has not justified all our hopes, and everyone recognizes the fact that while always useful in tetanus, it is not an absolutely certain remedy. The reason for this is that we are only able to recognize tetanus when contractures occur, i. e., when general poisoning has already taken place. This, however, is no longer a fact in diphtheria, for, while it is also a toxic malady, the poisoning follows the presence of angina or laryngitis, and we are warned, by the presence of the false membranes, before the poisoning has become declared.

Since 1891 we have pursued a series of experiments in the treatment of diphtheria by the antitoxic serum, at first upon animals, and later on children. Before publishing anything on this subject, we determined to obtain a sufficient number of facts to enable us to judge the method properly. Now we are enabled to declare that our results confirm, in all essential points, those that have been published by Behring and his collaborators.

*Read at the congress of Hygiene at Buda-Pesth.

I.

PREPARATION OF THE DIPHTHERITIC TOXINE.

The animals which furnish the antitoxic serum are immunized against diphtheria, that is to say, they are accustomed to the diphtheritic toxine.

The toxine is produced by cultivating the virulent diphtheritic bacillus in broth, in the presence of air. Under usual conditions, the cultures must be maintained for a number of months at a temperature of 37 C. (98.6 F.) in order to allow the poison to accumulate. A more rapid procedure has been recommended by Roux and Yersin; it consists in making the cultures in a current of damp air.

Flat-bottomed flasks are used, provided with a lateral tube (Fernbach's flasks) containing alkaline broth, peptonized at 2%, so that the liquid layer will be of but slight thickness. After sterilization in the autoclave, they are impregnated with fresh and very virulent diphtheritic bacilli, and the incubator is heated to 37C. When the development has well begun, the bent tube of each flask is connected by means of a rubber tube with a pipe issuing from a copper tube which is itself connected with a water blast pump. By means of screw closers placed on the rubber tubes the amount of air entering the neck of each flask may be regulated as it arrives after bubbling up through a washing jar. This arrangement is better than that which connects all the flasks together and supplies them all with air from the same current. After three weeks, or four at the most, the culture is sufficiently rich in toxine to be employed. At the bottom of the flasks we see a heavy deposit of bacilli, while the surface is covered with a veil formed by younger microbes. At this time the reaction is strongly alkaline.

All diphtheritic bacilli, even when they appear to be equally virulent for guinea-pigs, do not give the same amount of toxine in the cultures. A trial of bacilli from various sources will show those that make the largest amount of toxine. No bacteriologist will be astonished to hear that the strength of the toxine is not always the same in cultures made, in all

appearances, under identical conditions. Hence it is well to make a large provision of toxine before beginning a series of experiments, so that these may be thoroughly comparable one with another.

The finished cultures are filtered upon a Chamberland tube and the clear fluid kept in well filled flasks, corked and kept in the dark at the ordinary temperature. Thus prepared, the toxine commonly kills a 500 grm. guinea-pig in 48 hours, with a dose of a tenth of a c. c. After a long time it loses its activity, but very slowly if kept in the manner indicated above.

II.

IMMUNIZATION OF ANIMALS.

Dr. Carl Frankel was the first who immunized guinea-pigs against diphtheria by inoculating them by injection, with toxine that was modified by heating it to 70C. (158F.). Then Behring recommended the mixture of toxine with trichloride of iodine. He now prefers to inject very small doses of pure toxine at sufficient intervals to allow the animals to remain

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healthy. Brieger and Wassermann obtain the same result by injecting a culture of diphtheritic bacilli in thymus broth, after heating it to 60–70C. for a quarter of an hour. All these processes are successful, but it should be well understood that the thorough immunization of small animals, such as rabbits and guinea-pigs, is always a lengthy and delicate operation.

The immunization of females which give a good deal of milk, such as goats and cows, presents a peculiar interest, since Ehrlich has shown us that the antitoxine passes in the milk. A milch cow that is well immunized is a source of antitoxine. Its milk is, of course, far less active than its serum, but the antitoxine which it contains may be condensed within a small volume, and hence is a good primary material for the preparation of antitoxine.

Of all animals capable of furnishing large amounts of anti-diphtheritic serum, the horse is the easiest to immunize. It

bears the toxine much better than the other animals we have mentioned. We often see horses that have received from the first a dose of two to five c. c. of strong toxine, injected under the skin, and which present only an ephemeral febrile movement and a local œdema which rapidly disappears. If we admit, with Behring, that the serum of an animal is all the more antitoxic and he shows the greater sensitiveness to the toxine, the choice of a horse may appear as a bad one. But, since 1892, we began to immunize horses against diphtheria because, following the results obtained by Roux and Vaillard with tetanus, we knew that serum of horses is inoffensive for animals and for men, even when injected in large amounts. When injected under the skin it is immediately absorbed, and without local reaction. Moreover, nothing is easier than to take from the jugular vein of a horse, as frequently as it may be desired, and perfectly pure, large quantities of blood from which a perfectly limpid serum may be removed. We have some horses from whose jugulars, by means of a large trocar, blood has been removed more than twenty times, the vein remaining as supple and as permeable as on the first day. Their immunizing power is in the neighborhood of 100,000, and it would be easy to increase it.

In order to immunize our horses we inject gradually increasing doses, under the skin of the neck or back of the shoulders, of a toxine of a great activity and able to kill, in doses of $\frac{1}{10}$ c. c. in 48 hours, a guinea-pig weighing 500 grammes. On the same day this horse was bled for the first time (87th day of the experiment), he bore an introduction in the jugular of 200 c. c. of diphtheritic toxine without being incommoded by it. In the evening he had a slight fever, but did not lose his appetite.

The serum so removed has a preventive power superior to 50,000, i. e., a guinea-pig proves resistant to an inoculation of a half a c.c. of very recent and violent diphtheritic culture if, twelve hours before, he has received a quantity of this serum equal to the $\frac{1}{50000}$ part of his weight. A mixture of $\frac{1}{10}$ cc. of this serum and one c.c. of toxine does not cause local œdema in the guinea-pigs under whose skin it is injected.

The horse is therefore the best animal that can be employed in the preparation of the anti-diphtheritic serum. His indifference to the toxine of diphtheria spares the experimenter many difficulties that are experienced with more sensitive animals.

When the horses have been brought to a sufficient degree of immunity, it is a question whether it is best to maintain this immunity by means of frequent subcutaneous injections of small amounts of toxine, or by the occasional introduction of larger amounts within their veins. The second process is the handiest; the toxine (300 to 500 c.c.) is injected at the time the animal is bled and he is allowed to rest for about twenty days, but it is less efficacious than the first. In experiments on the immunization of animals against tetanus, Vaillard and Roux found that the most active serum was obtained by multiplying small injections of toxine. The same is true in diphtheria. It would seem that the cells must be frequently excited in order to constantly secrete antitoxine.

III.

ANTI-DIPHTHERITIC SERUM.

When a certain amount of the serum of an animal that has been immunized against diphtheria is added to diphtheritic toxine the latter becomes harmless. The mixture, made in proper proportion and injected to animals, causes them no trouble and does not even determine a local reaction. The toxine appears to be saturated. This action not only takes place *in vitro* but also occurs within the body. An animal protected by a sufficient dose of serum will not be affected by doses of toxine that would prove mortal in other animals. The toxine may even be injected first and the serum several hours later, and the animal will not die. Of course the amount of serum needed to save him will vary according to his weight, to the dose of toxine that has been given, and to the moment at which the intervention is decided upon. The serum is preservative and therapeutic, not only for the toxine but also for the living poison. These properties, discovered

by Behring, are the basis of the treatment, and are due to a special substance called antitoxine, whose nature is as much hidden to us as that of the toxine itself. These two substances possess common characters; they are altered by heat, precipitated by alcohol, and carried down by divers amorphous precipitates which may be produced in the liquids in which they are in solution. These peculiarities are common to nearly all the preventive or antitoxic substances which exist in the serum of animals that have been immunized against various infectious diseases. The only thing that distinguishes one from another is the specific action of each upon a determined virus or poison.

The animals which receive the diphtheritic antitoxine become refractory to the disease in a very short time. The immunity is established at once, but it does not last; it disappears within a few days or weeks according to the potency of the dose of the serum that has been administered. This temporary immunity is very different from that which is acquired by the slow process that we have described.

What action is exerted upon the toxine by the anti-diphtheritic serum? Are the two substances neutralized or do they exist side by side? If they are not saturated why are the effects of the poison no longer manifested? It appears as if the toxine must be destroyed. But a mixture which gives no effects in a guinea-pig will still act in a rabbit, in which it produces a marked œdema of the tissues in which it is injected. The results will change with the mode of experimenting. We can only say that the anti-diphtheritic serum is not antitoxic in the true sense of the word; added to the toxine it leaves it intact; injected in animals it acts upon their cells, causing them to lose their sensitiveness to the poison. The proof of this is seen in the fact that an amount of serum which preserves an ordinary animal will fail to save one that has been weakened beforehand by injections of other microbes or microbic products. If the antitoxine destroyed the toxine, a given amount would be efficacious in all guinea-pigs of a given weight. The natural explanation of these facts must

reside in the action of the serum upon the cells. The lively cells of a healthy animal respond to the stimulation of the serum, whereas in an animal that appears healthy, but who has been weakened previously by microbic injections, these cells are unable to protect.

The serum that we obtain from horses keeps very well without alteration, for all manipulations are performed with the greatest possible cleanliness. It is kept in the dark in sterilized flasks, to which nothing but a piece of melted camphor is added. The serum which is dried *in vacuo* can easily be sent at a distance, and reassumes its preventive qualities when dissolved in eight or ten volumes of sterilized water. This solution gives rise to a slight transitory local swelling which is never seen with the natural serum.

It may prove useful to condense an antitoxine which, as in milk, is too greatly diluted, but it appears to us to be a useless procedure to condense a serum which must again be diluted.

IV.

ACTION OF THE SERUM IN THE DIPHTHERIA OF MUCOUS SURFACES.

Most experiments in serum-therapy have been practiced on animals under whose skin the substances were injected. Behring and his co-laborers have mentioned several, however, in which the injections were practiced upon the mucous membranes. These are very interesting, since in practice we do not find that diphtheria is developed in the midst of the tissues, but upon the mucous surfaces of the throat and larynx. Hence we should cause a diphtheria of the mucous surfaces of animals and see how it behaves under the action of the serum. This is the best way for preparing for the actual treatment of children.

It is very easy to give a vulvar or vaginal diphtheria to a female guinea-pig. The mucous surface of the vulva and the vaginal entrance may be scratched, as was done by Loeffler, or, better still, may be slightly cauterized with a heated glass rod. Then the diphtheritic germs are applied. In a few hours there is redness and swelling, and the œdematous

mucous membrane becomes covered with a grayish, adherent membrane. There is strong fever, a vaginal discharge, and in two or three days we see the evidences of general poisoning; the animal loses flesh and dies. This process has the advantage of showing the evolution of the local process, and the modifications brought about by treatment. This false membrane is of the same nature as that observed in children, and contains diphtheritic and foreign bacteria.

1. *Serum injected preventively.* Female guinea-pigs always resist the action of the virus when a sufficient amount of the serum is injected prior to the vaginal inoculation. In proceeding in the manner already described there always occurs a false membrane; but, while in the control cases there is a red and œdematous mucous membrane with high fever, and a bad general state, the treated females show less extensive redness, less swelling and a mild degree of fever. From the second day the local lesions diminish and the mucous membranes show a beginning reparative action. Females of the same weight were experimented on. Those that were unprotected died on the sixth day, while those which received a preventive inoculation equalling $\frac{1}{10000}$ part of their weight recovered. When the dose of serum is not sufficiently strong the animals apparently recover, but succumb later on to cachexia. The same things occur if the serum is injected at the same time that the inoculation is made.

2. *Serum injected after inoculation.* The false membrane is well developed after twelve hours, and the redness and swelling of the vulva are marked. If at this time an injection of serum of from a 10,000th to a 1,000th part of the weight of the animal is made, the animal will recover very well. A few hours after the œdema is arrested the swelling diminishes, and on the second day the false membranes become detached. When the mucous membrane is healed no more diphtheritic bacilli can be found.

One is astonished at the rapidity with which the false membranes become detached and disappear when these guinea-pigs are compared with control ones that die with the extensive lesions of the vagina in five to six days.

3. *Action of the serum on animals whose tracheas are inoculated.* Tracheal and laryngeal diphtheria is, in children, by far the most severe form. The bacillus often invades the lung, when the absorbing surface becomes enormous and the poisoning is very rapid. Besides, the respiratory difficulty may call for tracheotomy, in which the wound itself facilitates secondary pulmonary infection and increases the danger.

In order to properly judge what results we might obtain in actual practice, it was therefore necessary to experiment with animals whose trachea or larynx were involved.

Rabbits are best for this purpose. The trachea is incised, the mucous membrane scratched with a platinum needle and then inoculated with the needle charged with diphtheritic bacilli. The wound is then closed. On the morrow these animals have fever, in 48 hours the breathing is uneasy and noisy, as false membranes keep developing; one can even perceive, at a distance, a very characteristic noise.

Guinea-pigs so inoculated commonly die in three days when not treated. Rabbits die in from three to five days. In these animals the trachea and the larynx were injected and false membranes covered the mucous surfaces and often extended to the first ramifications of the bronchi. The lungs, congested in spots, showed a few bacilli.

When guinea-pigs or rabbits are thus inoculated, after having received an injection of preventive serum, they do not acquire diphtheria, or, at any rate, they show no manifestations of it. When the amount of serum is insufficient the disease stops for a time and then there is a relapse. In some instances, after too small an injection, we have seen guinea-pigs go through a mild diphtheria and die two months later with lesions of the kidneys and the suprarenal capsules.

If the serum is injected after inoculation there is an arrest of the evolution of the diphtheria.

4. *The anti-diphtheritic serum in diphtherias complicated by the association of other bacteria.* The diphtherias thus associated with or complicated by the presence of other bacteria, especially the streptococci, are among the most severe that are

to be seen. Most frequently the disease involves the lungs, which, at autopsy, show foci of broncho-pneumonia, wherein are found the diphtheritic bacilli and the streptococci. Roux and Yersin have already shown that a virus of small virulence may become deadly for guinea-pigs when inoculated at the same time as a streptococci not very virulent by itself. Is the anti-diphtheritic serum capable of curing these complicated cases? This constitutes a question of the greatest interest on account of the frequency of the existence of these mixed forms in children. Dr. Funk has investigated it and finds that this simultaneous infection determines an increase in the production of the diphtheritic toxine, but that the presence of the streptococcus does not prevent in any way the neutralizing effects of the antitoxine. Hence, in these cases we must simply inject larger amounts of antitoxine.

Funk inoculates under the skin; we inject in the trachea so as to imitate as closely as possible the actual conditions of practice. The bacilli and streptococci were inoculated in the manner mentioned above. The streptococci had been taken from a diphtheritic child and were therefore one of those forms that are found in associated diphtherias. Isolated in a pure culture, it does not cloud broth and is not very virulent for rabbits. Two c.c. of a recent culture in broth injected in the veins of a rabbit only kills him after ten days. One c.c. introduced under the skin causes an erysipelatous sore with transitory fever and without serious disturbance of the health. The same amount placed in the trachea of a tracheotomized rabbit gives it a brief elevation of temperature without pronounced malaise. The diphtheritic bacillus added to it is the same virulent one that has served in our other experiments.

The association of these two microbes produces in rabbits a diphtheria running a rapid course, as seen in very young children. The anatomo-pathological lesions are the same. In both cases there is broncho-pneumonia with abundant bronchial secretion.

In these cases of associated diphtheria the serum but rarely cures. This is not because there is a formation of larger

amounts of diphtheritic toxines, or because the antitoxine action is hindered, but because the cells that are stricken by the poison of the streptococci no longer feel the stimulation of the antitoxine. In a number of other experiments the animals treated 12 hours after the inoculation invariably died, notwithstanding repeated injections of the serum. We frequently saved rabbits, treated seven or eight hours after, by repeated injections of serum. It is here important to repeat the injections in order to be assured of a definite cure.

Would we obtain better results in these associated cases by the simultaneous injection of anti-diphtheritic serum and the serum of rabbits immunized against erysipelas? Dr. Marchoux, of the Pasteur Institute, has supplied us with a serum of this sort which, however, has as yet failed to give us good results, though a rabbit inoculated with it outlived for several days a control rabbit. Perhaps this serum was not sufficiently efficacious against the sort of streptococcus that was employed.

V.

RESULTS OBTAINED IN CHILDREN.

After all of these experiments on the preparation of the anti-diphtheritic serum and its action on inoculated animals, we felt that we were prepared to undertake the treatment of diphtheria in children. The kindness of the physicians at the head of the Hôpital des Enfants Malades placed at our disposal the diphtheritic pavilion and enabled us to carry out the task we had undertaken.

We began this treatment in February, 1894. We visited the pavilion every day and treated all the children found there in whatever condition they might be at the time. No choice was made, so that the net results of the treatment can be compared with the results obtained before. Nothing was changed in the care given the patients, the local treatment was the same that had been adopted before (glycerine and salicylic acid, borated washings, etc.), the serum was the only new element introduced; to it, therefore, must be attributed the changes that took place.

The statistics of the diphtheritic service were made out for previous years, both by the matron and by the superintendent of the hospital and furnish us all the elements needed for a comparison. Finally, the experiments were conducted from February 1st to July 14th, including the winter months when it is most severe and the summer months when diphtheria is seen more rarely. Besides, in Paris there is another children's hospital with a diphtheritic service, the Hôpital Trousseau; as the serum was not employed there, it affords us a precious means of comparison.

During the years 1890 to 1893, 3,971 children were admitted in the diphtheria pavilion and furnished 2,029 deaths; *a mean mortality of 51.71%.*

During the serum treatment 448 children were admitted to the pavilion, with 109 deaths, *or a mortality of 24.5%.*

All other conditions having remained the same, the difference between 51.71% and 24.5% measures the benefit brought about by the treatment.

During the same months of February, March, April and June the Trousseau hospital received 520 diphtheritic children who received no serum, and among whom there were 316 deaths, or a mortality of 60%.

No one can therefore state that the epidemic during which our experiments were carried on was a light one.

But it is proper to distinguish between the anginas (pharyngeal diphtherias) and tracheotomized croups, which are infinitely more serious.

During the four years just mentioned the anginas have, at the Enfants Malades, given a mortality of 33.94%.

During our period of treatment the mortality was 12%.

At the Trousseau, without the use of serum, they were 32%.

The mean mortality of operated croups was 79.19%.

Under the serum treatment it has been 49%.

At the Trousseau, during the same time, it has been 86%.

The above numbers are absolutely comparable with each other. They are mere numbers, but numbers that possess some eloquence, and that proclaim the superiority of the treatment by anti-diphtheritic serum.

Such as I have given them, these numbers do not allow for the fact that in all diphtheritic wards are admitted a number of children that do not have true diphtheria. They have pseudo-membranous anginas, and sometimes even croup, but without the Klebs-Löffler bacilli. These affections are brought about by other bacteria, and are much less dangerous than true diphtheria, since Martin and Chaillou observed 79 cases of them without a death in this same pavilion, and Tezenas, of Lyons, reported 146 cases without a death. These pseudo-diphtherias are by no means rare; Roux and Yersin have observed that a quarter of the children admitted to the pavilion do not have true diphtheria; Martin and Chaillou have found an even greater proportion. All these cases should therefore be deducted, since they might give the serum a credit which does not really belong to it. A rigorous statistic should only bear upon angina and laryngitis recognized by bacteriological examination as being of a truly diphtheritic nature.

Hence we must, from our 448 children, deduct 128 who did not have true diphtheria. This leaves 320, among whom 20 died immediately upon admission. These 20 did not receive the serum, and are not to be counted among those that were treated. As a matter of fact, therefore, 300 children suffering from true diphtheria were admitted, and it is in them alone that the action of the serum is to be appreciated.

These 300 diphtheritic children, treated with the serum, gave 78 deaths, or a mortality of 26%.

The anterior researches of Roux and Yersin, and of Martin and Chaillou have shown that in the same hospital, the mortality among the children affected with true diphtheria, established by bacteriological examination, before the serum treatment, was of 50%.

We will now relate all that has seemed of interest in the observation of our little patients, in order to enable the reader to appreciate the effects of the serum and the manner in which it was administered.

The serum was furnished by horses which had been immunized in the manner already described. Its activity varied between 50,000 and 100,000. One c.c. of toxine mixed with 1-10 and even 1-30 c.c. of serum becomes entirely inoffensive for guinea-pigs. When injected in the cellular tissue it causes no œdema.

As soon as admitted, every child received an injection of 20 cc. of serum, under the skin of the flank. If the subsequent bacteriological examination showed that it was not a case of true diphtheria, the injection was not renewed. One hundred and twenty-eight children suffering from non-diphtheritic anginas were thus inoculated without the slightest ill-effect; it has even appeared to us that in some cases their condition was improved. They remained for some days in the diphtheritic pavilion without acquiring diphtheria. This is an experiment which shows the prophylactic value of the serum.

When the injection is well done, in the subcutaneous tissue, it is not painful, and the serum is absorbed in a few minutes. In the great majority of cases there is no local reaction; if antiseptics has been neglected there may be a redness lasting 24 to 48 hours. In three cases only we had an abscess which rapidly healed after incision. In true diphtheritics we practiced a second injection 24 hours after the first, amounting to 10 or 20 cc. This was usually sufficient to bring about a cure. The pulse and temperature guided us; if the latter remained high we made a third injection of the same amount. The average weight of the children admitted was 14 kilog. ($33\frac{1}{2}$ lbs.), so that at the first injection they usually received about one-thousandth of their weight of serum. The smallest amount used was 20 c.c., and the largest 125 c.c. As a rule the children received more than a thousandth of their weight of serum, and in a few cases were given nearly a hundredth. During convalescence, a few days after the injection, occur eruptions, often ill-defined, most frequently resembling urticaria. These eruptions, which are not accompanied by any fever, are due to the serum. Besides these, we see others

which are accompanied by a febrile movement. These are chiefly seen in the associated diphtherias, and should be classed among the infectious erythemas, which are frequent in anginas.

It will now be proper to study the modifications brought about by the treatment in the march of the malady, considering separately the anginas and the croup.

A. Anginas. All recent works distinguish between simple and associated anginas. Properly speaking, diphtheritic anginas are never simple, for other bacteria are always found with the bacilli of diphtheria in the pseudo-membranes; yet this bacteriological division corresponds to clinical types that are perfectly distinct. Simple, or pure anginas, sowed on serum, give rise to diphtheritic colonies, with few or even no colonies of foreign bacteria.

(a) *Pure, or simple, anginas.* 120 cases, 9 deaths, mortality, 7.9%. The 120 patients had diphtheritic anginas in all stages of severity. The culture from the false membranes gave 47 times very numerous colonies, made up 45 times by long or medium sized bacilli, and twice only by the short bacilli; 28 times the colonies were in small numbers, formed 13 times by the short bacilli. From the bacteriological standpoint at least 43 of these anginas were of great severity.

The children were brought to the hospital at various periods of their illness, these being very difficult to determine. Upon this point the assertions of the parents are very unreliable. They will declare that a child is only ill since the day previous, when the membranes are already extensive, and the general condition deplorable. The physicians who send the children to the hospital frequently do not recognize at once the diphtheritic nature of the trouble, and give as its beginning the time at which the false membranes first appeared and the general condition became bad. Hence it is useless to try to classify the children according to the day of the disease upon which the treatment was begun.

The amount of serum injected in these cases varied between 20 c.c. and 85 c.c.

General condition. The general condition of the children treated with the serum improves very rapidly, unless they have been admitted at a too advanced stage of the disease. We may say that the appearance of the children is entirely different from what it used to be; we no longer see in the wards these pale and leaden faces, for they remain more rosy, while the children themselves are more cheerful and lively. We have already said that complications are rare.

The appetite returns soon and the loss of weight is slight. The duration of the stay in the hospital is notably lessened.

False membranes. The effect of the serum upon the local lesion is manifest, the false membranes cease to spread in the 24 hours following the injection. They usually become detached in 36 to 48 hours, on the third day at the latest. In only seven cases they persisted longer, and in one instance they kept on forming till the tenth day. The bacilli disappear from the throat at the same time that the membranes do, cultures proving unsuccessful from the third to the fifth day, with very few exceptions. When the false membranes were tenacious, successive inseminalations gave less and less numerous colonies, always, however, formed by virulent bacilli. Later on nothing appeared but colonies of cocci which took the place of the specific bacilli.

Ganglia. The cervical ganglia are always engorged, but the cellular tissue is hardly ever thickened around them. They can be felt for a long time.

Temperature. The temperature is rapidly lowered under the influence of the serum. In the less severe anginas the fall occurs most frequently on the day after the first injection; it seldom awaits the second day. This fall is a sudden one, shown on the charts by a nearly vertical line, as if the disease had stopped suddenly. Before the treatment we had never observed such falls in the temperature of diphtheria. They give excellent prognosis. A single injection does not suffice to lower the temperature in severe cases, the fall only takes place after the second or third injection and occurs by lysis. As long as the temperature does not go below 38C. (100F.)

the cure cannot be considered as being complete, and it will be better to hasten it by further injections.

Pulse. In mild cases the pulse rate is about 120, in severe cases 140 and more. The serum acts on the pulse more tardily than on the temperature. The former will often be high for two or three days after the temperature has dropped. In severe cases, after repeated injections, the pulse-rate diminishes, but only temporarily. It again goes up to 120 and stays there for some days after the temperature has fallen. The pulse never becomes normal before the temperature. Since using the serum we no longer observe those irregularities of the pulse that were formerly the rule.

Respiration. At the beginning of diphtheritic angina the respiratory rhythm is not greatly modified, excepting in very young children, in whom it is accelerated. Fifty-six of our patients had laryngeal symptoms that threatened croup; thirty-one had a raucous voice, and twenty-five had lost their voice and had croupy breathing. Many of them were spared tracheotomy—thanks to the serum; but that is an important point to which we will return in speaking of non-operated croups.

Albuminuria. Drs. Martin and Chaillou found that only one-third of the children suffering from diphtheritic angina have no albuminuria, all the others have precocious or late albuminuria. In 120 children treated with serum, fifty-four had no albuminuria, twelve had it only on one day; the balance had albuminuria. Persistency and abundance of albumen was only noted in the most severe cases. It is therefore certain that the serum prevents the action of the toxine upon the kidneys and lessens considerably the albuminuria.

Complications. Eight children had nasal diphtheria with discharge. They entered the hospital late, and two died.

Measles was present in eight cases.

In five cases diphtheria was complicated with scarlet fever. They all recovered.

In five cases there were polymorphous eruptions appearing at various times, without elevation of temperature. They

disappeared without affecting the convalescence. Twice, after an urticarial eruption the patients were threatened with suppuration of the cervical ganglia.

Mortality. The statistics of Martin and Chaillou permit us to establish exactly the mortality of pure diphtheritic anginas; in ninety-six children observed in 1891 and 1892 they had thirty-eight deaths, or a mortality of 41%. In 120 similar cases treated with serum we had nine deaths. Mortality 7.5%.

Among the nine children that died, seven had been in the hospital less than twenty-four hours. They can scarcely be counted as failures of the method, since they lived but a few hours after the injection. If we eliminated these, we would obtain the following results: 113 anginas, two deaths. Mortality 1.7%.

(b) *Associated diphtheritic anginas.* These are so called when the cultivation of the false membranes upon serum results in the growth of, besides the specific colonies, numerous colonies of other bacteria. All these associations are not equally dangerous, and we distinguish three varieties: 1. Association with a small coccus, quite frequent in anginas, which we will call Brisou's coccus, because a child of that name furnished Roux and Yersin, and later, Martin, with a specimen of it. 2. Association with the staphylococcus pyogenes. 3. Association with streptococci. These three varieties correspond with well marked clinical types.

When we spoke of non-operated diphtheritic croups without angina, we called attention to the fact that the injections of serum, by stopping the production of membranes and loosening those that were already formed, saved several children from tracheotomy. That is a point worthy of closer attention. Among the 169 cases admitted with angina, fifty-six had laryngeal trouble; of these, thirty-six had the hoarse voice and twenty-five had loss of voice and croupy breathing. Hence we might have expected these last to have required tracheotomy. Under the influence of the serum (and in these cases we must not fear to practice an injection every twelve hours) the croupy breathing diminished, then only showed

itself at intervals; the child would expectorate the false membranes and in two or three days the respiration became normal, to the great astonishment of the house-staff and of the attendants, who, owing to their great experience in such matters, had already made up their minds that tracheotomy would be unavoidable. This agrees entirely with our statement about the prompt detachment of the false membranes, in the anginas that are treated with the serum.

Now, in a child with croupy breathing, we must not be in a hurry to operate. We must inject serum and wait as long as possible. We can easily show that since the beginning of the serum treatment the number of tracheotomies has diminished greatly in the pavilion. Martin and Chaillou show that in 1891 and 1892 50% of the children admitted were tracheotomized, while with the serum treatment only 40% were operated on, or 121. Of these, 102 were operated on before the first injection or within twelve hours after, fourteen between the 24th and 36th hour, and only five more than 36 hours after the beginning of the treatment. How many children would be spared tracheotomy if the serum could be injected earlier! We will even state that, with the serum treatment, tracheotomy should in most cases be replaced by intubation. This is the more true that we will no longer have to leave a tube *in situ* for many days; as a rule it will be enough to keep it in place for a day or two, in order to prevent threatening asphyxia and gain time until the false membranes are detached. Our conviction in this matter is so strong that we soon expect to be able to show, by a series of facts, that intubation is the complement of serum-therapy. In the future, tracheotomy will be quite exceptional, to the great advantage of children.

As a local treatment we avoid all swabbings with caustic or toxic substances. Two or three irrigations a day with simple boiled water, or, better still, with water containing 5% of Labarraque's solution. No bichloride, no carbolic acid, we prefer boiled water to antiseptic fluids that can only be swallowed with a certain amount of danger. The diphtheritic toxine is quite sufficient without the help of other poisons.

Three hundred children with ascertained true diphtheria gave a percentage of 26% of deaths, as against 50%, the usual mortality.

Could we do better still? We are certain that it is possible. But this improvement cannot be obtained through any change in the treatment, but in the improvement of the diphtheritic service in the hospitals. We fear this may take a longer time to achieve than was spent in the discovery of the serum-therapy.—*N. Y. Therapeutic Review.*

Albany Board of Health,

Bacteriological Department,

ALBANY MEDICAL COLLEGE.

ALBANY, N. Y., December 26th, 1894.

To Physicians:

It is at the present time considered fully proven and universally accepted that true diphtheria depends upon the presence of the Klebs-Loeffler bacilli. It is also admitted that there are other forms of sore throat which cannot be distinguished clinically from true diphtheria, but which are not at all, or only slightly contagious, rarely go on to fatal termination and are due to other bacteria than the Klebs-Loeffler bacillus. This knowledge, for a time purely of theoretical and scientific interest, has now by the work of an American investigator, Dr. Park of New York, been made of the most practical value. This has been accomplished by making cultures on sterilized blood serum in a test tube directly from the affected parts of the throat. The inoculated test tube is then kept from 10 to 12 hours at a temperature between 90° and 100° F. until the growth of the micro-organisms present has proceeded to such a point that an examination can be made. Some of the colonies of bacteria are then smeared on a covered glass, stained, and examined with a high power lens. The diagnosis can now be made; whether the case is one of true diphtheria or an affection of the throat, simulating diphtheria, but only slightly dangerous.

For the success of this work it is necessary that the physicians of the city should heartily co-operate with the board of health, carefully making the inoculations, and filling out the blank forms accompanying the box containing the test tubes. When the bacteriological diagnosis does not harmonize with the clinical facts and the history, as shown by antecedent or subsequent cases of diphtheria, and where there are any defects in the service, physicians are earnestly requested to promptly report such cases.

It has been noticed that occasionally, when culture tubes are inoculated immediately after irrigation of the throat with antiseptic solutions, the cultures do not show any Loeffler bacilli, although subsequent examinations may demonstrate their presence. This observation should be noted in making inoculations.

Members of a household, in which exists a case of diphtheria, should be regarded as sources of danger, unless cultures from their throat show the absence of virulent diphtheria bacilli.

Persons who have suffered from diphtheria, should be kept isolated until second cultures prove the bacilli have disappeared from the throat, for not only are the bacilli which persist in the throat virulent, but they are not infrequently the cause of diphtheria in others.

This circular, prepared by a committee consisting of the medical members of the board of health, has been adopted and directed to be issued to the physicians of the city.

By the Board: Oren E. Wilson, President, F. C. Curtis, M. D., P. E. McCabe, G. B. Schill, M. D., D. H. Cook, M. D., W. S. Dyer, C. H. Smith, M. D., Edward H. Long, Secretary.

A laboratory for bacteriological examinations has been provided at the Albany Medical College, and Dr. A. MacFarlane will act as examiner. The materials required for making cultures can be obtained free, from the following places: A. B. Husted & Co., State and Eagle Sts., C. H. Gaus, Washington Ave. and Lark St., F. J. Smith, 277 Clinton Ave., Otto

Schultz, 322 S. Pearl St., Frederick Neudorf, Jr., 829 Broadway, F. Bayard, Madison Ave. and Ontario St., T. E. Walsh, 17 and 19 Watervliet Ave., H. J. Grose, No. 1 Clinton Ave., cor. Broadway, C. H. Smith, No. 246 Washington Ave., Office of the Board of Health.

DIRECTIONS FOR MAKING CULTURES IN SUSPECTED
CASES OF DIPHTHERIA.

The patient should be placed in a good light, and, if a child, properly held. In cases where it is possible to get a good view of the throat, depress the tongue and rub the cotton swab gently, but freely, against any visible exudate.

In other cases, including those in which the exudate is confined to the larynx, avoiding the tongue, pass the swab far back, and rub it freely against the mucous membrane of the pharynx and tonsils. Without laying the swab down, withdraw the cotton plug from the culture tube, insert the swab, and rub that portion of it which has touched the exudate gently, but thoroughly back and forth all over the surface of the blood serum. Do not push the swab into the blood serum, nor break the surface in any way. Then replace the swab in its own tube, plug both tubes, put them in the box, and return the culture outfit at once to the station from which it was obtained.

A report will be forwarded the following morning by mail, or can be obtained at the Medical College, before 12 o'clock noon.

The Curative Serum in Diphtheria.—The meeting of the "Naturforscher" could not possibly pass without a declaration on this all-important subject, and for this Behring and Ehrlich were the heroes. Behring led off with the first paper. He said the curing of acute disease by means of specific applications was not thought of till very recently, when the toxins were found to possess an antidote for tetanus and diphtheria, which are not exactly complete in all details yet, although far advanced in proving the efficacy of the method now adopted. Diphtheria and tetanus appear to be solved, and shortly typhoid, pneumonia syssa, if not tuberculosis, may be added to the list. He tells us his attention was attracted to the subject in 1880, when wounds and bacteria were receiving special attention. In pursuing this further, he experimented with iodoform in this direction the following year. From these experiments he concluded that the bacteria themselves were not to be wholly considered, but that the toxins or products were more important than the microbe itself. In 1890 his first success was in the cases of diphtheria in guinea-

pigs, which has now been extended to man. This anti-toxic immunity was then proved to reside in the serum; but Ehrlich, by more extensive experiments, has proved its existence in plant life also. It is found by experiment that the oftener the inoculation, the greater will be the immunity; the protective power remaining the same in quality, but the quantity varying in the different animals. Another step forward was made by Pasteur in his weak and virulent cultures where immunity was obtained by a slow process of growth. This method may now be relegated to the past as a mark of our forward progress and success in the treatment for diphtheria and tetanus, which may be extended indefinitely. We have material before us that may open up a great future in the record of therapeutics. We have now almost mastered the proof of applying an antidote for infectious diseases or checking and modifying the chronic. Protection is equally established, but whether the microbe is killed or the receptive faculty of the body destroyed, is not clearly demonstrated.

With this knowledge of diphtheria, we are now able to calculate our gain on the effects it will have on population during the next decennium, if the serum therapeutics be adopted. In Germany and Austria alone, roughly speaking, 2,000,000 children die every ten years from diphtheria. Of those, it is assumed under the new regime that one and a half millions will be alive at the end of this period. It has now been admitted that within the first three days ten per cent. of the cases died, and five per cent. of those commenced within four hours. If the prophylactic virtue of the serum were commended sufficiently early, this moiety of death could be averted, which can be accomplished with very small doses at half a mark each.

Ehrlich said that he owed a deep debt of gratitude to Behring for his untiring efforts on this subject without remuneration or assistance of any kind. After all the albuminous fluids of the body had been tried, the blood serum had at last been found to be the most practicable. The milk of an immune animal can also be used with efficacy, but cannot always be practicable. The Berlin "Kinderanstalten" have not been so successful in the use of the serum as many other institutions appear to have been, as 53 deaths are reported out of 530 attacks. These results must be taken with reserve, as too small doses were given at the commencement of the treatment, as proved by the better results later on. Of 40 cases, 20 of whom were tracheotomy ones, only 6 of the latter class died. In other 41 cases, where the serum was not used, 18 died. On another occasion, he treated 48 cases and only 6 died, making a death-rate of 15.05 per cent. of the total number treated. If the moribund cases on reception were eliminated, this number would fall to 8 per cent., or if those suffering from nephritis, myocarditis, etc., were removed, the genuine diphtheritic mortality would be under three per cent.—*Medical Press*.

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ANNOTATIONS.

The Serum-therapy for Diphtheria.

The interest shown by both physicians and the laity in the new serum-therapy for diphtheria, is at present so widespread, that the subject was thought to be of sufficient importance to devote the entire number of the *Annals* to it.

The wave of enthusiasm which overspread the whole world by the premature announcement of Koch of the discovery of tuberculin, was so tremendous that after it had passed it left in its wake a depth of scepticism so profound, that any similar form of treatment is looked at askance by very many practitioners.

In the presentation of the theme, therefore, both sides of the question are given. The foregoing articles are strongly in its favor, while the 'paper' which follows, vigorously attacks it. But while the article by Hansemann, who is the assistant to Vichow and, therefore, is supposed to voice the opinions of his chief, is the best that has yet appeared assailing the serum-therapy, yet its arguments are not sufficiently convincing to outweigh the remarkable series of successes that have been reported by the use of the antitoxin, and the consensus of opinion seems at present to point strongly in favor of this form of treatment.

Report on Diphtheria and the Heilserum.†

BY DR. HANSEMANN, BERLIN.*

(*Berliner Klinische Wochenschrift*, Dec. 10, 1894.)

In these days of great advances in medicine there are two sources of error. First, a question is not sufficiently investigated when it is made public and thus merely provisional conclusions are presented. Before these conclusions are thoroughly examined and confirmed they are often used as the foundation of further investigation and the ground work of more advanced theories. Thus it occurs that often elaborate investigations are based upon insufficiently proved premises.

Second, the literature of any subject is so enormous that one is hardly able to cover it all. Oftentimes it happens that in investigations made some years ago and now to a large extent forgotten, what was absolutely proven and what due to theory and speculation, become confused in our minds. Such an experience was passed through during the tuberculin rage, and now it would seem to be necessary to consider the whole subject of diphtheria and learn what is fact, what is mere hypothesis and what has been solved from facts.

Diphtheria, as described by Bretonneau, is a well-known infectious disease which in most cases is diagnosticated without difficulty. In obscure cases a diagnosis is often not possible on the first day, at times not on the second day. The prognosis is in every case, uncertain—the most severe forms may recover, the mild case may later become severe, while cases which have apparently recovered may die from heart failure or resulting paralysis.

The diphtheria may be pathologically divided into a more fibrinous, a more gangrenous and a more phlegmonous form. These forms may be combined, and all have these common

†An abstract translated from *Berliner Klinische Wochenschrift*, Dec. 10th, 1894, by Andrew MacFarlane, M. D.

*Dr. Hansemann is a privat-docent in the University of Berlin and an assistant of Prof. Virchow. As the latter had pricked the bubble of tuberculin when at its greatest popularity, it was feared that Dr. Hansemann in the present instance simply echoed the opinion of his chief. In the discussion which followed, Prof. Virchow however, while not accepting the scientific basis of the serum treatment, admitted its apparent great therapeutic value and recommended its use by the profession.

characteristics, that the mucous membrane necroses more or less deeply and is covered by a membrane containing a number of bacteria. Of these bacteria, Loeffler, in 1884, described a bacillus of characteristic appearance. He did not then claim that this bacillus was the cause of diphtheria and he himself advanced the following reasons against any such deduction.

- (1) The bacilli are absent in a number of cases of typical diphtheria.
- (2) The bacilli are not found in the pseudo membrane of inoculated dogs and hens in the typical arrangement observed in men.
- (3) No effect is produced on animals sensitive to inoculation when the bacilli are applied to the uninjured mucous membrane of the pharynx, larynx and vagina and to the conjunctiva.
- (4) The animals which recover after inoculation show no symptoms of paralysis.
- (5) Bacilli, identical in form and in physiological characteristics, are found in the mucous membrane of healthy children.

These objections seemed then, so conclusive that Loeffler did not consider his bacillus the cause of diphtheria.

To-day the status of this question is as follows:—

- (1) The Loeffler bacillus is not found in all cases of Bretonneau's diphtheria, but only in about 75 per cent., although practically, all of these cases must be regarded as typical diphtheria.
- (2) The Loeffler bacillus is never found alone, but in conjunction with other bacteria, as staphylococci, streptococci, pneumococci, micrococci and a number of other bacteria.
- (3) Then again, the Loeffler bacillus is found in diseases not identical, either clinically or anatomically, with Bretonneau's diphtheria as phlegmon of the skin, by mild conjunctivitis, by light pharyngitis and by rhinitis fibrinosa. In these cases, only the virulent Loeffler bacilli are considered.

If now, the Loeffler bacillus be injected subcutaneously, an œdematous swelling with local hemorrhage follows. When the injection is rapidly fatal, pleuritic effusion and hyperæmia of the supra-renal capsules result. If a chronic condition ensues, the œdema is changed into a hard infiltrate which undergoes necrosis. If the bacilli are carefully placed on the uninjured mucous membrane of the mouth or vagina, nothing results—but when they are roughly rubbed in, or if abrasions have been previously produced, a fibrinous exudate appears, different from that of croup or diphtheria, in that it is not progressive, but limited to the spot where the bacilli were placed. The same kind of an exudate can be produced by other bacteria, as pus cocci and by chemicals, as ammonia. The resulting disease has not the most distant resemblance to Bretonneau's diphtheria.

Then, too, experiments have shown that guinea pigs though sensitive to the Loeffler bacilli, have never spontaneously contracted diphtheria, although they have been placed with children sick with diphtheria, and been fed with diphtheritic membrane, while other animals, as cats, have under similar conditions, contracted the disease. The Loeffler bacilli have therefore not been shown to be the cause of diphtheria, though in many cases they play a distinct part. The basis for the use of "Heilsersum," is

- (1) A cure is produced by an immunity due to the action of the disease itself.
- (2) This immunity is the result of the formation of an "antitoxin," a chemical body which destroys the toxic effects of the bacteria.

The first is a pure hypothesis and not an accepted fact, and like many other theories in regard to cure and immunity is still in the domain of conjecture. It certainly is a fact that recovery can follow from an infectious disease without resulting immunity.

In regard to the antitoxine, no one has seen it, no one has described it, no one has separated it. It is not a thing of fact, but of theory. The following claims are made for this agent:

(1) It produces immunity.

(2) It cures.

(3) It is harmless.

(1) Sixteen cases are mentioned in which immunity did not result from its use. Behring must have had similar experience, as he has increased the strength of the dose necessary to secure immunity, and the duration of the immunity appears very variable.

(2) It is claimed that the membrane disappears quickly and in a characteristic manner, while the fever suddenly falls. This assertion is however strongly denied by several clinicians who claim that the disease proceeds in a normal manner as in mild cases. The number of cases is yet too small to warrant any deduction. Other forms of treatment have given better results, as Meyer of Aachen, who in 15 months, treated with ice 60 cases of diphtheria of which a number were severe, with only one death; while Bonnebin, by local treatment, lost only 37 out of 427 cases. The use of "Heilserum" has also had the effect of bringing to the hospitals for treatment, many mild cases which formerly did not come to the hospital.

The claim that all cases treated in the very early stage are cured, is not sustained by fact, as seventeen fatal cases, treated in the very early stage, are enumerated. A number of paralyses have also been observed after treatment with serum.

(3) After the injection of the "Heilserum" many cases have been reported with severe sub-dermal hemorrhages, pains in and swelling of joints, high fever at times above 104° , and coma. It also appears to cause in some cases, serious kidney trouble. The following are the writer's conclusions:

(1) There are no scientific, theoretical or experimental ground for the claim that the "Heilserum" is a specific for diphtheria.

(2) Proof of the specific curative power of serum in the human species has not been shown by practical experience.

- (3) The serum may under certain conditions do harm by its destructive effect on the blood and kidneys.

In the discussion on a Hansemanns paper before the Berlin Medical Society, Virchow said "that treatment by diphtheria antitoxin was begun last March in the Kaiser and Kaiserin Friedrich Hospital. At that time Dr. Aronson had placed his serum at the disposal of the hospital—a present of the value of about 4,000 marks (\$1000)—for which the hospital owed him sincere thanks. In June and July nearly all diphtheria cases were treated with the serum. The results were as follows:

In the first week, cured 13; deaths, 1 child					
"	second	"	"	9	" 1 "
"	third	"	"	6	" 2 children
"	fourth	"	"	12	" 1 child
"	fifth	"	"	6	" 2 children
"	sixth	"	"	1	" 1 child
"	seventh	"	"	3	" 0 "
"	eighth	"	"	5	" 0 "

Suddenly the supply of serum ceased, as, unfortunately, the very horses from which the serum was taken died. The old methods of diphtheria treatment had again to be resorted to, and the results were:

In the first week, cured 5; deaths, 7 children					
"	second	"	"	6	" 8 "
"	third	"	"	6	" 6 "
"	fourth	"	"	8	" 11 "
"	fifth	"	"	8	" 5 "
"	sixth	"	"	8	" 12 "
"	seventh	"	"	13	" 6 "

This sad increase in mortality induced the hospital to return to the serum, which was then procured from Hochst. Immediately there was a change:

In the first	week,	cured	3;	deaths,	2 children
“ second	“	“	4	“	1 child
“ third	“	“	14	“	1 “
“ fourth	“	“	14	“	2 children
“ fifth	“	“	17	“	1 child
“ sixth	“	“	17	“	5 children

The total figures were as follows: In the whole space of time 533 cases were treated—303 with serum, 230 without. The former had 13.2 deaths; the latter 47.8 deaths. Virchow continued that, in view of these results, he held it to be the duty of every doctor to use the serum in diphtheria. “All considerations,” he added, “must give way to the brute force of these figures.” He continued that, even if disagreeable by-effects were proved to occur here and there, they were not sufficient to dissuade him from continuing the treatment. Turning to the theoretical question, he said that he considered the disease artificially produced in animals by means of the Loeffler bacillus had nothing to do—anatomically—with Bretonneau’s diphtheria. Nor did he consider the bacillus as the cause of human diphtheria. A theoretical explanation of the therapeutic action of the antitoxin serum must be left to the future.

Thus Virchow recommends the serum, to which he attributes a brilliant therapeutic action; at the same time he pronounces the theory which forms a basis of Behring’s entire antitoxin therapeutics to be a fallacy. Needless to say that his words were followed with breathless interest. The discussion was adjourned to the next meeting.—*British Medical Journal*, Dec. 14, 1894.

Concerning the Manufacture of Antitoxin, by Parke, Davis & Co.—In answer to the many inquiries which come to us with reference to supplies of antitoxin, owing to the fact becoming generally known through the Associated Press report, that we have begun the manufacture of this substance, we beg to state our position as follows:

A considerable time ago steps were taken toward the manufacture of this product, for which purpose a special department, a Bacteriological Laboratory, was established. This department has been newly fitted out and is divided into three sub-departments.

The first is the laboratory proper, and contains all the essential apparatus, appliances and glassware, including powerful microscopes, hypodermic syringes, surgical instruments, etc., the latter being necessary both for inoculating the toxin and dissecting the test-animals.

The second sub-department contains the incubating ovens; hot-air and steam sterilizers of different sizes for sterilizing the culture media on which the bacilli are propagated; apparatus and instruments used; and the wire cages in which the test-animals—white mice and guinea-pigs—are kept.

The third sub-department contains the cages of white mice and guinea-pigs required for determining the strength of the toxin and antitoxin.

Independent of these departments are the special stables provided for the care of the healthy young horses which are to be inoculated with the toxin, and from which the antitoxic serum is subsequently obtained. These stables are under the supervision of an experienced veterinary surgeon.

The whole process, beginning with the production of the toxin, is a very delicate, complicated and lengthy one. The toxin cannot be inoculated upon the horses before it is of the proper virulence, which is ascertained by its power to kill guinea-pigs of a certain weight, when administered in a given quantity, in a certain time. The inoculation of the toxin upon the horses has to be made frequently at shorter or longer intervals in small doses until the blood drawn from time to time from the horses shall in its serum contain sufficient antitoxin to counteract the effects of the toxin. While a quantity of toxin will kill a guinea-pig of a given weight, the second test-animal receiving the same dose of toxin must not succumb to the operation when a given quantity of antitoxin is injected previous to or after the toxin injection.

The process for manufacturing the antitoxin is usually as follows: A small colony of diphtheria bacilli is placed on a suitable culture medium (bouillon containing certain admixed substances). The culture is kept at the body temperature. The bacilli multiply rapidly, consuming certain portions of the culture medium during the course of their growth and propagation. At the same time they secrete other substances, among which is the poison or "toxin", soluble in water. After propagating the colony for several weeks, a sufficient quantity of toxin is formed. The culture is then filtered through porous porcelain; the dead bacilli are thus separated, the strength of the filtrate is tested on the test-animals and definite doses are injected into horses hypodermatically. A mild attack of disease is produced, but it soon disappears. The animal will now bear a larger dose, and this treatment is continued several months, the doses of toxine being steadily and progressively increased until the animal will bear many times the dose which would at once kill an animal not habituated to the poison. The next step is to withdraw from the animal a quantity of blood, which is set aside. The red blood-corpuscles and the fibrin deposit at the bottom of the vessel, and the supernatant liquid or serum is decanted. This serum is a light-yellow liquid and contains the antitoxin of diphtheria. Briefly summarized, Behring's curative serum is, therefore, blood-serum of animals immunized by the injection of the diphtheria toxin.

Standardization of the antitoxin is effected by observing closely the results of physiological experiments. The first step is the determination of the lethal dose for an animal, such as the guinea-pig (of known weight), of a toxin solution which has been prepared in sufficient quantity to form the standard for a large number of cases. The quantity of antitoxin which must be previously injected to protect the animal from the action of this lethal dose is then determined, and the ratio between the weight of antitoxin and the bodily weight of the animal furnishes a means of representing in definite units the strength of the solution.

Considering, therefore, the above circumstances in connection with the manufacture of antitoxin, it will be perhaps late in the spring before we shall be in position to supply this product of our own manufacture.

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DIATHESIS.*

BY

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In these days, when so much is being done in the department of bacteriological research and with the apparent desire of all to ascribe each particular form of disease to its own individual germ, I think that we are apt to overlook that minute but ever present condition of the system, known as Diathesis.

This term is not employed as much to-day as by our ancestors in medicine. The older writers devote considerable space to the consideration of Diathesis with the apparent idea of grounding the student in a condition already present in the patient before taking up the general diseases to which he is liable; but in the modern text book the subject has lost much of its importance as a factor in disease.

In the light of modern scientific investigation we cannot, of course, recognize in the subject all that Kortum and Hufeland claimed for it in 1795. These writers claimed many diseases as belonging to the scrofulous diathesis that we now recognize as tuberculosis, and the peculiar types, which they claimed were constant, are now valuable only as suggestions or hints that the peculiar conditions are present.

*Read before the Hartford Medical Society, December 3d, 1894.

Lines were drawn very finely between affections which are now recognized as having no direct association with any peculiar diathesis. Still, Dr. J. Graham Brown, in his *Medical Diagnosis*, published in 1884, claims much for the subject and under the term constitution describes seven different forms with their types.

That there is such a thing as Diathesis no one can deny.

Dunghlison describes it as a "disposition, constitution, affection of the body or a predisposition to certain diseases rather than to others." The five principal Diatheses mentioned are the cancerous, scrofulous, rheumatic, gouty, and tuberculous, and a brief consideration of these will apply to all Diathetic diseases.

Hereditary influence or tendency has always been considered as a very decided cause of cancer and many cases are on record which point, almost conclusively, to a direct inheritance, as in a case reported by Sir James Paget, a lady who died "with cancer of the stomach, one of her daughters died with cancer of the stomach, another died with cancer of the breast; and of her grand-children, two died of cancer of the breast, two of cancer of the uterus, one of cancer of the axillary gland and one of cancer of the rectum." The author quoted traced out this influence in one out of three cases; Mr. Sibley in one out of every nine, but Mr. Bryant denies that this tendency is more common in cancer, as one of many diseases, than in any other, and says "all that could be said of cancer as a constitutional disease could be said of any of the smallest growths in the body."

No one doubts, however, that the hereditary tendency in tumors as a class is very strong and constant, proving that there is something in the make-up of an individual which presents a favorable soil for new growths.

The second form of diathesis, the scrofulous, is deemed by many as a distinct and separate condition; claiming it as simply a different manifestation of tuberculosis. Virchow differentiates by the greater frequency of scrofulous inflammation in such parts (skin, conjunctival, pharynx) as are

seldom or never visited by tuberculosis. To these is sometimes added cold abscesses, and in children, especially, opthalmic affections, catarrhal inflammation of the middle ear and diseases of the bones and glands.

The distinctive character of these diseases are: they are caused by slight injuries or irritation, are slow going and difficult to heal and are apt to involve neighboring lymphatics.

On the subject of rheumatic diathesis much has been written, denying the hereditary nature of the disease.

Among the principle theories advanced are exposure to heat and cold, an excess of lactic acid in the blood and a malarial poison.

Maclagan firmly believes in the constitutional and hereditary theory of the disease and gives as his reasons: 1st. The tendency to attack those of a particular age. 2d. The liability to repeated attacks in the same individual. 3d. Many joints suffer simultaneously or in succession, and 4th. The tendency to heart affections and the rarity of suppuration.

As in the three forms of diathesis considered, so with tuberculosis, but I think there is less opposition to this than any of the others.

It is now pretty well recognized and accepted that there is an hereditary predisposition to consumption and that the germ of Koch is an accompaniment.

Solis Cohen, in his article in Hare's System, on tuberculosis, says, "there is in the constitution of the individual, anterior to bacillary infection, something that determines the fact of infection and largely determines, also, the course and character of the results of infection."

That disease should be inherited consists with all that we know of hereditary transmission. There is no reason why internal peculiarities should not be inherited, as well as external — why a peculiar condition of the internal organs should not be handed down from generation to generation as well as special casts of features, family traits and characters, and the peculiarities of conformation present in whole families in the resemblance of one child to another in some

respects and the similarity of all to one or the other parent. Dalton says in his chapter on reproduction: "The most prominent feature of generation as a natural phenomenon, is that the young animals are the same kind with their parents and that generation not only gives rise to new animals, but seems to continue the species with its characteristic qualities."

That this must be so can be seen in a brief review of the nature of reproduction. In the higher animals, by the union of the sexes, the egg of the female is impregnated by the spermatozoa of the male. Immediately following the impregnation changes occur in the egg and certain phenomenon take place. The vesicle disappears and the segmentation of the vitellus occurs producing the three blastodermic layers of cells. From these layers of cells the foetus is developed and the future of the child is dependent on the strength and powers of these cells and his tendency to disease is also influenced by them. So intimate is this association that diseases like syphilis and small-pox are conveyed direct.

Our body is made up of cells originally the result of the action of the cells in the layers of the blastodermic membrane. The life of these cells in the body, aside from function and repair, is growth and reproduction. It is an easy matter to see how peculiar tendencies are transmitted from parent to child by the action of these cells. If the cell growth is normal and strong its reproduction is strong and the new cells grow, perform their function and reproduce in a normal manner. But if the cell in its growth is poorly nourished and weakened its function is weak and its reproduction is weakness. This weakness developed gives the germ of disease its proper soil for development and constitutes diathesis.

These tendencies do not always manifest themselves at birth and may for a time go unrecognized. Certainly a peculiar constitution would be apt to do so if one parent were strong enough to offset the lowering effect of the other, or if the life of the individual were cast amid pleasant, healthful

surroundings and moderately free from care and anxiety. But sometimes that tendency is bound to show itself.

There is always present in each individual a certain amount of reserve power; more in some, of course, than in others, and as long as this power can be held in reserve, the repairing power of the cells goes on. If, however, from excesses, deprivation or worry, extra outlay is required and the balance of power lessened or destroyed it is then that the diathesis shows itself and the particular form the break-down assumes is very apt to be influenced by the constitution of the individual.

Many diseases are classed and treated as independent disorders that are simply manifestations of a peculiar constitution, that is often unrecognized. That a diathesis must predispose to a certain train of diseases or symptoms is evident but I think this fact is often overlooked. We have so many new ideas in medicine, so many new germs to become acquainted with, so many new drugs to try and formulæ introduced by enterprising firms as certain cures for certain diseases or symptoms that we are apt not to appreciate the true significance of these symptoms. In many cases aside from the apparent disease, there is a constitutional tendency to be treated.

Solis Cohen says of the treatment of tuberculosis: "Independent of the invasion of the microbes, there is a disease to be treated and the microbes will come and go harmlessly." If this is so consumption cannot be treated by inflating the rectum with gas, or by inhalation of any form of vapor or the injection of any substance designed to kill the germ of tuberculosis with an utter disregard for the lung and for the general condition of the system that allows a resting place for the germ.

Perhaps the day may come when the same principals now recognized in tuberculosis may be applied to other diseases, and that many diseases little understood or unrecognized as independent disorders may be classed as diseases due to hereditary influences.

Appendicitis is attracting considerable attention in the medical world to-day as a germ disease and the weight of testimony certainly does point to the action of the bacillus coli communis as the cause.

Considering appendicitis as due to this germ several questions naturally suggest themselves. Why should a germ, present in the normal appendix, as found by Clado of Paris, act as a poison to some and not to all? Why should one man in a community suffer from appendicitis and others not? Why should the disease be mild in one and fatal in a few hours in another? And why should the disease return once or many times?

Seeking a possible explanation of this problem, in the history of two cases I have had lately, and noticing the striking similarity, I present, in connection with the subject of inherited predisposition to disease, my notes of these cases:

CASE I. *Family history:* Father's mother invalid for some six or eight years before death. Had some uterine disease. Died at 49. Father's father died from effects of shock at 58. Mother's family history good with the exception of her mother who had a heart trouble. Mother never very strong. Very nervous, Subject to neuralgia. Had a heart lesion. Father, history good with exception of rheumatism one winter.

Patient's history: When young was never well. Pneumonia at three months. Membraneous croup at three years. Always croupy. At four had an enlarged liver. Abdomen always hard and prominent. Had periods of nausea and vomiting. Large head, forehead prominent. Bow-legged. Had none of the exanthematous diseases except measles, but this he had the hardest of the family. Mother always careful about exposing him to disease. Had nasal catarrh until about fourteen or fifteen years old.

In this history there is present a decided rachitic tendency.

CASE II. *Family history:* Father's mother had chronic phthisis for years and finally died of it. Many of her family

died of phthisis. Her brother lost two children by acute phthisis.

Father's father died suddenly. The exact cause I could not learn, but for the last few years of his life had some bladder trouble.

Mother's mother living at 80 in fairly good health.

Mother's father died at 80 of shock. Had had two before and was partly paralyzed for two or three years.

Father never considered very strong. Died of cancer of the liver. Until four or five years before death had periods of pain in right side, appendix region, brought on by reaching in taking down tobacco.

Mother never been well since a child. Had all children diseases. Subject to sick-headaches. Has had rheumatism. Of a nervous disposition.

Patient's history: Always sickly. Never well until third year. Took cod-liver oil regularly until his sixth year. In infancy had bowel trouble, was poorly nourished and very fretful. Walked at $1\frac{1}{2}$ years. First tooth late and all slowly. At $2\frac{1}{2}$ years had what was called catarrh of the stomach and was very ill. Milk did not digest. Always had nasal catarrh. Dr. Bacon removed a fungus growth from vault of pharynx. Also removed similar growth from sister. Weighs 140, about six feet tall. At time of attack was working hard setting tobacco. This case presents a strong tuberculosis tendency.

I do not present these cases as conclusive proof that appendicitis is a disease due to an inherited predisposition. I fully realize that two cases count for naught, as a basis on which to found deductions in medicine. There is present, however, in each those elements, although perhaps dormant, which would offer less resistance to a disease of the appendix, especially if we consider it as a glandular organ, than in a healthy person unless he were reduced by hard work, worry or any depressing influence.

In this paper I have considered principally, and in a very imperfect manner, the hereditary diathesis as a factor in the production of certain diseases.

The influence on a child, of these several diatheses, not reproducing their own peculiar types, but predisposing to all diseases and influencing their course is a phase of the subject which deserves much more attention than I can give in the time allotted me to-night. That this lack of stamina, as it might be called, has a decided bearing in our prognosis of cases can be seen and appreciated daily. Take two patients, side by side, both suffering apparently from the same illness; one, although he may have the disease in its most severe form, passes through all its stages and recovers promptly and fully. The other, with a lighter attack, dies, or if he recovers, does so slowly and incompletely. Two cases, in the ward, are brought in about the same time, with similar injuries. Both are operated on—one recovers promptly, the other, dies. And so this influence might be continued through all diseases and injuries. To trace the hereditary influence as seen in alcoholism and crime would fill a volume. The subject of diathesis grows in importance the more thoroughly it is studied.

In conclusion, while I would not for an instant underrate the germ theory of disease or criticise those enthusiastic workers in the field of bacteriology who are ever seeking for the advancement of our science; while I would not condemn the new theories of disease as we see them almost every week in the journals—I would urge a more careful consideration of the old and well known fact—the inherited predisposition to disease.

The Symptoms of Chronic Diffuse Nephritis.*

By HOWARD VAN RENSSELAER, PH. B., M. D.

Of the various diseases to which the kidney is subject, by far the most common is that which embraces those particular pathological changes which we characterize by the name of chronic diffuse nephritis.

Some confusion exists in the nomenclature of the diseases of the kidney, depending for the most part on the peculiar mode of thought and point of view of the individual author. Thus, some authorities having in mind the general pathological changes which successively appear in progressive kidney lesions, describe a stage of congestion, a stage of exudation, and stage of contraction; others again speak of a catarrhal or a croupous nephritis; the anatomists class them according to their gross appearance into the large white, the small red, and the waxy kidney. The microscopists divide them according to the part or parts of the kidney effected, into tubular, glomerular, parenchymatous, interstitial, and diffuse nephritis; while clinicians may consider them simply as acute and chronic Bright's disease.

Of these various classifications, for the purposes of this paper the chronic changes will be spoken of as the parenchymatous, meaning by that, that the morbid processes are confined to the epithelial lining of the tubules and capsules of the glomeruli and the diffuse nephritis, in which are involved the tubes, glomeruli, the stroma, and the arteries, in other words the entire kidney structure. And it is to the symptoms of this latter, the chronic diffuse nephritis, in its clinical aspect that this paper is devoted.

At the outset, it must be confessed, that although the pathological structural changes in the two varieties of parenchymatous and diffuse nephritis differ markedly one from the other, yet clinically they can easily and naturally be combined under the general head of chronic Bright's disease; and especially when we consider the fact that while some-

*Read before the Medical Society of the County of Albany, January, 1895.

times it is easy, yet at other times it is extremely difficult and well nigh possible even by the closest study of the symptoms and course of the disease to make a differential diagnosis between the two anatomical lesions during the patient's life.

As the symptoms of the two conditions are so similar it will be advantageous for us first to consider briefly those which are common to both varieties and then to dwell more at length on the peculiarities which in a general way teach us that in any particular case the disease is of the chronic diffuse, rather than of the parenchymatous variety.

At the initial examination of any patient suspected of kidney disease, the physician resorts at once to a careful analysis of the urine, and thereby derives considerable information. Changes in the urine then, are among the earliest, most constant and most important symptoms of deranged kidney function.

Knowing that adult men pass on an average 40-50 ounces of urine, with the specific gravity from 1012-1025, and that the amount of urine bears a comparatively constant ratio with the specific gravity, provided that sugar is absent, and that normally for the most part the water should be free from albumen, we are prepared to attach clinical importance to any constant deviation from this standard.

Many external influences, of course, may produce temporarily in perfectly healthy individuals, marked differences in the amount and specific gravity of urine passed in twenty-four hours, yet careful analysis of these cases show that the total amount of urea passed is nearly constant, no matter how copious or scanty the flow of water may have been. Among such influences are climatic conditions, in which during cold wet days large quantities of pale urine are voided, while during hot dry weather the water is quite concentrated; then the amount of fluids imbibed; nervous influences, such as fear, excitement, etc.; conditions of the bowels and of the skin; the action of drugs; high fevers, etc., may each modify to a considerable extent the quantity and appearance of the urine voided.

After accounting for these disturbing influences, any long continued deviation from the standard amount and specific gravity is an evidence of disease.

As regards quantity, nearly always in some period of kidney trouble the urine is diminished in amount; especially is this the case in acute nephritis, and in the early stages of the parenchymatous variety, and towards the close of the disease it is found in all forms of kidney lesion. When the diminution is great, it usually gives rise to cerebral symptoms, such as headache, restlessness, delirium, muscular twitching, convulsions, stupor, and coma. These symptoms are only touched upon here, as they will be fully considered in a subsequent paper. Increase in the quantity of urine is frequently found in the small red, the large white, and waxy kidneys; the increased quantity being usually associated with abnormally low specific gravity; and quite commonly the specific gravity is low even when small quantities of urine are voided, the total quantity of urea being regularly diminished in Chronic Bright's disease.

Blood is found in some cases, especially in the acute exacerbation of chronic diffuse nephritis.

Albumen in the urine is a very common symptom of kidney lesion, but it will not be discussed here as it has already been fully treated in a previous paper of this series.

Quite commonly in urine from diseased kidneys we find cylindrical bodies called casts. These are composed of a homogeneous material to which epithelial cells may adhere. The hyaline casts are composed of this substance alone; the waxy casts seem to be the same material more condensed; the epithelial casts are those in which the renal epithelium adheres to the hyaline casts, while the fatty and granular casts are disintegrating forms of the above varieties. In chronic diffuse nephritis all these forms of casts may be found.

An accumulation of serum in the subcutaneous connective tissue, in the serous cavities, or the lungs, is usually present in most chronic cases.

The gastro-intestinal tract suffers functional derangement, such as loss of appetite, dyspeptic symptoms, nausea and vomiting, while diarrhoea is a complication which is sometimes of use and sometimes is difficult to cure.

Dyspnoea is another symptom which is frequently very troublesome to the patient.

Impairment of the eyesight is a common and sometimes an early affliction in this disease.

Anæmia and pallor are quite constantly present.

The group of symptoms which are embraced under the head of uræmia will also be discussed in another paper.

Such then are in a very condensed form prominent symptoms common to both varieties of chronic Bright's disease.

In the particular form of kidney lesion which we are discussing, the chronic diffuse nephritis, although the minute structural changes are practically identical in all cases, and although the patients suffer in a general way from the same train of ailments, yet there is a great diversity in the sequence in which these symptoms appear, and also in the prominence of certain disorders over others.

The course which the disease runs in persons who are suffering from the atrophied kidney is very various. The following are some of the different ways in which it begins and progresses.

Sometimes the disease may have existed for some years without presenting any renal symptoms, and is discovered only at the autopsy when the person has died from accident or some other disease.

Again the lesion may be present for a long time without symptoms, when, after some acute disease or even an accident, the renal manifestations are suddenly produced.

At times without any marked symptoms, the patient gradually loses flesh, his strength fails, he becomes languid and disinclined to work; his appetite is poor and his digestion is feeble. Frequently in this condition the specific gravity is low, and there is at times a trace of albumen in the urine. These ailments sometimes continued for years and the

patient may die from some intercurrent disease without showing other signs of kidney disease, or, after a time other characteristic symptoms may develop.

Sometimes the patient feels miserable for months, with loss of appetite, nausea and vomiting, and frequent headaches; they become nervous, depressed, irritable, and suffer from insomnia. The urine is normal or of a low specific gravity, and is apt to contain a trace of albumen. After a time they rapidly become worse and then the ordinary symptoms appear.

In other cases, loss of vision, headache, insomnia, or dyspnoea may usher in the later appearing regular symptoms.

Neuralgia of various parts of the body may precede other manifestations of the disease.

Occasionally the very first departure from health may be a convulsion, or there may be repeated attacks. The patient may die during such a convulsion, or the other symptoms may be subsequently developed.

Evidences of heart disease may mask those of the kidney when both diseases co-exist.

Polyurea is sometimes first noticed by the patient and he comes to the physician for relief. Examination of the urine reveals a low specific gravity, and sometimes a little albumen and a few hyaline casts.

Dropsy may be present almost from the first, and general anasarca then supervenes.

These are some of the typical ways in which Bright's disease progresses. But frequently we meet with cases suffering from some of the numerous complications which are apt to occur with this disease and which further complicate the study of the symptoms.

The complications are numerous; the most common being some associated lesion of the heart, such as dilatation of the ventricle, cardiac hypertrophy, and valvular disease.

The arteries are so often involved that sometimes we hear spoken of a Bright's disease without involvement of the kidney. The changes in the arteries may be a sclerosis and thickening of the wall, or an endarteritis deformans, or an obliterating arteritis.

Cerebral apoplexy is fairly frequent with chronic diffuse nephritis.

Thickening of the pia mater, or dilatation of the lateral ventricles sometimes exist.

In the chest, in addition to the lesion of the heart itself, we may find pericarditis, emphysema and chronic bronchitis, while phthisis, and a usually fatal form of pneumonia occur. Cirrhosis of the liver also sometimes co-exists. Other complications are met with from time to time but the ones mentioned are the most common.

When we consider how great may be the variety of onset and course of this form of kidney trouble, and with how many different pathological changes in other parts of the body it is apt to be associated, it is easy to see how difficult it is sometimes to make a correct diagnosis, and this especially when we attempt to differentiate it from other chronic forms of kidney diseases, and also how eminently unsatisfactory treatment becomes.

Answers to Inquiries Concerning Craig Colony for Epileptics.

So many letters are received from all parts of the country, concerning the admission of patients and asking for information regarding the objects of the Colony, that it has been deemed best to give all the facts in the following circular:

The Colony consists of 1,856 acres of land, near Mt. Morris, in Livingston county, New York. There are upon it 35 or 40 buildings, which are being put in order for the accommodation of patients. The Colony was named for Oscar Craig, late President of the State Board of Charities. The law establishing Craig Colony was passed in the spring of 1894. Governor Flower appointed a board of five managers, consisting of Dr. Frederick Peterson, 60 W. 50th street, New York City, President; Mrs. C. F. Wadsworth, Geneseo, N. Y.; Dr. Charles E. Jones, Albany; W. H. Cuddeback,

Buffalo, and George M. Shull, Mt. Morris, Secretary. George S. Ewart, of Groveland, Livingston county, N. Y., was appointed Treasurer, at a salary of \$200 a year.

The object of the Colony is to provide for the four great needs of Epileptics which are not satisfied elsewhere:

1st. To give them schools where they may attain any degree in education.

2d. To provide industrial training of all kinds, for there is no vocation which some epileptics may not follow.

3d. To give them a home, when all other doors are closed to them.

4th. To see that each and every case is carefully studied and treated by the best scientific methods the world affords.

Such objects can not only be attained in a community, village or colony, devoted to this particular class of cases. There are several such colonies in Europe, but none in this country.

Epilepsy is a peculiar disease, characterized by loss of consciousness and a convulsion. The fit or epileptic seizure recurs from time to time, and may last from a few seconds to a few minutes, sometimes longer. Some patients have fits every day, or oftener, some once a week, some once a month, some only once or twice a year. It is only during the fits that they are incapacitated. At other times, they are well and strong and healthy looking, and quite as able to work and study as are other people. But the fact that they have these fits, no matter how rarely, debars them from many of the privileges enjoyed by their more fortunate brethren. They will not, on that account, be received into the public schools, and can receive no education. They cannot attend church or social gatherings. They are shunned by their playmates and they become burdensome to their families. When they grow to adult life nobody wants to employ them, so, although they are able to learn a trade or profession, the shops and colleges are closed against them. No general hospital receives them as patients, and, in fact, there is no place at all which is open to them except an alms-house or

insane asylum, and as the insane asylum is better than the alms-house, many patients are sent there, in preference to a poor house.

There are about 600 epileptics in the county alms-houses of New York state. There are 400 in the state insane asylum. The Colony is intended to provide for most of these. When the Colony opens, the patients from the alms-houses will be the first to be received and these gradually. The law will not permit of any private patients being admitted until all the patients upon public charge are provided for in the Colony.

It is hoped to open the Colony for the reception of a hundred or more patients in the summer of 1895. It is probable that the Colony will ultimately number from 1,500 to 2,000 members, and it is certain to become in the course of time, a self-supporting industrial and agricultural village. It will more than rival the similar and celebrated Colony at Bielefeld. Germany, upon which it is, to a certain extent, modeled.

The Craig Colony will not resemble an institution in any particular, but will look more like a country town than anything else. As the patients are received, they will be set to work or at study, in various ways. They will take care of the farms, gardens and orchards, they will plan and build new houses. There will be among them tailors, shoemakers, printers, book-binders, masons. iron-workers, carpenters, painters, and so on. In fact, every sort of employment, every sort of recreation, everything, in short, that goes to make up the life of any country village, will be found in this Colony, the only difference being that the citizens of this community will be epileptics.

The resources of the land acquired are such that there is no doubt, whatever, that in the course of a few years, this Colony will be more than self-supporting, so that, from the economical stand-point, if not from the philanthropic, the scheme will be a wise one. There are 1,000 epileptics in this State now, in alms-houses and in the asylum, who are a

burden to the taxpayers, and these will be taken to the Colony and be made in due time self-supporting.

People of means having epileptics in their families will be allowed to erect cottages at their own expense on the Colony grounds, in which the patients can live under the direction and treatment of the physician of the Colony.

Dr. Wm. S. Spratling is the medical superintendent.

The Index Medicus, as we accidentally learn, is about to be discontinued. To publish it without a loss would require about 800 paying subscribers, and the work has been carried on of course at a heavy loss to the publisher, with less than 300.

The disappearance of this highly valuable publication would be a great misfortune, as everyone will admit who knows or cares anything about the literary aspect of medicine. What few recognize, however, is that it would be a misfortune not to the literary physician alone, but every practising physician would directly or indirectly find himself the worse off, and his patients likewise. In placing at the command of the therapist the digested and classified index of all chronicled medical labor, every future patient in one way or another must feel the good and are helped by so much. We cannot practice medicine to the best advantage without in some way or other knowing what our fellows have done and are doing in the same field of labor.

Now this periodical must not be discontinued! We have a suggestion to offer: In an accurate sense the *Index Medicus* is truly the continuation of the great *Index-Catalogue of the Surgeon-Generals Library*; so indispensable to the American medical profession, and such an honor to it and to its authors. Why should not the publication of the *Index Medicus* be continued by the United States Government? If the august legislators will save the money wasted every year on pocket-books and pen-knives for their pages it would probably be amply sufficient to publish the index. At all events, the work is distinctly for the public benefit and use, and the expense of its publication should be borne by the public. Why should it not appear as a part of the work of the office of the Surgeon-General? The library belongs to that department, and its publication of the *Index Medicus* would be both proper and right.

Why will not the College of Physicians of Philadelphia, the Academy of Medicine of New York, and any or all other medical societies pass resolutions or take steps to insure the continued publication of the *Index*.—*Medical News*.

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HOWARD VAN RENSSELAER, PH. B., M. D., EDITOR.

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ANNOTATIONS.

The Effect upon the Nursling of the Mother's Diet.—The feeding of infants on artificial food is a growing evil for which, although they inveigh against it, physicians are in a large degree responsible. Efforts are made to explain the evil away on such grounds as the desire of the mother to avoid the inconvenience of her natural duties, or of changed condition of life causing inability to furnish food in sufficient quantity, if at all, or of deficient quality of the mother's milk, or other conditions, for all of which the mother is responsible. These conditions do exist in a greater or less degree, but aside from actual or acute disease. the maternal conditions may be tersely summed up in the statement that the mother is unwilling to make the sacrifice necessary if she performs her duty to her child. The responsibility of physicians lies in weakly conceding to the patient's desires, in the place of strenuously insisting upon the mother's every effort to carry out the provisions of nature.

In these days of milk foods, prepared foods, substitutes for mother's milk, etc., mothers do not understand that the nature which provides organs for bearing children also provides organs for nursing children, and intends that these organs should be for use rather than ornament. She does not realize that the products of modern science at best are but poor substitutes for the products of nature. If the physician would insist upon the mother performing her natural functions, despite her assertions that she "cannot nurse her child", "never could nurse her children," "didn't have milk enough," "nipples too small or too tender," or "milk left her in two or three months," etc.—if the physician should insist, and the mother persist, both would be surprised to find that long abused nature would still be willing to do her proper work. Patient endurance of discomfort, persistent effort, and proper food will eventually demonstrate the ability to nurse their infants, in nine cases out of ten, mothers who assert the necessity, in their individual cases, for "bringing up the baby on the bottle". And that too, without scouring *materia medica* for imaginary galactogues, and likewise to the very great benefit of both mother and infant.

During the sixty years' service at the Preston Retreat, Dr. Joseph Price gave the medical profession, through that institution, some most valuable object lessons in obstetrical science. There was no secret in the methods used to make that institution the model maternity of the world, so far as professional results are concerned. His guiding principles were care, cleanness and common sense. The strictest supervision of every detail, scrupulous practical cleanliness and not so much of theoretical cleanliness, and simplicity in all matters, enabled him to complete his service with a mortality record never equalled in private or public maternity work. It was a law with him "to allow the mother to bear her own children", and it was equally the rule to require each mother to nurse her own infant during her stay in the institution. So very rare were exceptions to this rule necessary, that a nursing bottle could not be found in the entire institution. The

patients in the retreat were in no respects an exceptional class, save in the fact that so large a proportion of them were ill-nourished and impoverished in physical health when they entered the hospital—conditions which would entitle them to claim inability to nurse infants. Another fact of interest was noted, namely, that many mothers, who while in the house furnished abundant food supply, and left the institution with thriving babies, would, after leaving, put the baby on the bottle as a matter of personal convenience, and in a surprising proportion of such cases would lose their babies in a few months.

The moral to be drawn is that almost every woman who can bear a child can nourish it. Attention to the body functions, generous supply of simple nourishing food, and early and persistent efforts to establish and develop the mammary secretions were the only methods used to secure these results. In general practice the physician is too apt to give up the contest too early or to rely upon some form of stimulants to the glands, which eventually proves delusive if not injurious. It is common practice to administer alcoholic beverages in the form either of ale, beer, or porter to nursing women for the purpose of increasing the milk supply. Beyond question these articles are capable of doing much injury to both mother and child, and their indiscriminate employment for such purposes should be interdicted.

Dr. J. W. Byers, in the *Annals of Gynecology and Pediatrics*, has made some pertinent remarks on the subject. He says: "The truth is, in this practice of using alcoholic drinks the profession has followed the customs and whims of the laity, rather than the usual process of instructing and leading the latter. That there are conditions and circumstances in which the administration of malt liquors is a decided benefit to both mother and child, no one will undertake to gainsay. But that they are indicated in every instance of deficient lacteal secretion, or that the exigencies of the case ever render necessary their use to the extent as is commonly employed, none can maintain or justify. The promiscuous and general

practice of using malt liquors by nursing women is irrational, does a vast amount of harm, and often causes disease in the suckling. We know that the mammary gland, for all practical purposes, may be considered as an organ possessing functions of a two-fold or mixed character, secretion and excretion. Under normal physiological conditions the first of these processes is in almost exclusive operation, though, as shown by experiences, the slightest alteration in the condition of the organism, whether of an emotional, medical, or dietetic character, may so change this secretion that it becomes to all purposes and effects an excretion, and an innocuous, healthy pabulum for the child is converted into a deleterious or poisonous substance. Experience is very general in showing that the milk fats and albumins in increased proportions have a decidedly injurious effect upon the digestion of the infant when taken into the stomach in excessive quantities. From a number of experiments conducted by Zaleski he found these substances in the milk in excessive proportions whenever the mother had partaken of alcohol. In each case where the mother was tested with malt liquors, the fat and albumin appeared and caused more or less disorder and distress of the digestive apparatus of the suckling. These deleterious influences, however, were not the worst. Analysis of the milk further revealed the fact that it actually contained alcohol and the micro-organisms peculiar to malt liquors; that the liquor drunk by the mother actually passed out in toto through the mammary gland and on into the child's stomach, and there produced all the phenomena incident to digestive disorders and febrile disturbances. These facts point to the belief and support the attitude that the mammary gland under certain conditions exercises the functions of an excretory organ, and that under some circumstances it becomes nothing more than a filter through which the food and drink taken by the mother passes directly into the stomach of the child. This being true, we are in a position to understand and appreciate the importance of the relation of the diet of the mother and the well-being of the child. When we prescribe

alcohol for the mother, we at the same time do it for the child. The diet of the mother is a stage in the milk producing process, and the milk she produces is, in every instance, the result, and only the result of the food of which she partakes. If it be improper, unsuitable or contaminated, the milk will express this in a proper ratio. In the case that beer or ale is administered it will find this outlet, and while it does not evidence deleterious influences to the extent of producing the worst results in the form of either colic, indigestion, or diarrhœa, in every instance its effects are present, and these are always among the possible results of its use. The effects of fat and albumin, when present in breast milk in excessive proportions, in producing evil effects on the child are too well recognized to dwell upon. That the more severe of stomach disorders—gastro-intestine catarrh, enteritis, or even cholera infantum—are due to these substances, as the result of the abuse of malt liquors in the mother, is certain, though such is not generally admitted or recognized. Take care not to advise a woman whose milk supply is reasonably full to resort to beer or other liquors in order to increase it. Always impress upon them the increased risk to the child incurred by using them.”—*The Medical and Surgical Reporter*.

The Offspring of Young Mothers.—At the Congress of Hygiene, Dr. Korosi, of Buda Pesthe, stated that the proportion of deaths among children from weakly constitutions, or maladies traceable to the mother, was twice as large among the children of mothers under twenty as among the children of mothers over thirty. The author of this statement seems pretty sure of his facts, since they were consequent upon a comparison of several thousand cases. His investigation on the subject showed further that the healthiest offspring was born of mothers between twenty and thirty, united to husbands between thirty and forty. In Hungary fifteen per cent. of the number of marriages shows that the brides are under twenty years of age, and in England twenty per cent.—*Medical Record*.

A Dietetic Experiment.—The medical department of one of the infantry regiments of the Guards stationed in Berlin is engaged in carrying on gastronomic experiments, not on the usual patient laboratory animals, but on medical students (candidates for the army surgeon examination) who volunteer to serve as subjects of experiment. These young martyrs to science undertake to eat and drink nothing beyond the regimental rations during the period of observation, which lasts from a fortnight to four weeks. Daily they may be seen in full equipment marching out with the regiment sharing its fatigues to the full. Immediately on their return to barracks every day they turn into the Charite Hospital, where their temperature is taken, pulse, body weight, amount of perspiration, etc., registered, and even the stomach pump used on some of the most devoted. These experiments, which are carried out with true German thoroughness, are to furnish data for further improvement in the nutritive value of food supplied to soldiers on the march.—*Medical Record*.

Syphilis Among the Esquimaux.—It has been generally believed the Esquimaux were immune against syphilis, as no case was observed in one hundred and fifty years, although the infection was known to have been repeatedly taken to Greenland by sailors. After the year 1872 fifty cases were observed amongst the natives of the villages of Foighet and Areuk; in 1889 only ten cases were observed, while there have been none since 1890. Helms, in discussing the subject, attributes the rarity of the disease to a diminished susceptibility on the part of the natives. Other medical men equally versed in the pathology of the Esquimaux are inclined to ascribe the extinction of syphilis to the treatment and severe hygienic measures adopted by the Danish government, including the isolation of the infected village.—*Hospitals-Tidende*.

Accentuation of the Pulmonary Sound in Perityphlitis.—Dr. Julius Mannaberg, of Vienna, states that, of 88 cases of perityphlitis observed from 1882 to 1892 in the wards of

Professor Nothnagal, he was struck by the fact that the pulmonary second sound was accentuated, though no explanation of the symptom was given. Since then 13 cases have come under observation in the same wards, and in 4 of these the sound was markedly accentuated; in 7 it was distinctly louder than the aortic sound; in the 2 remaining cases both second sounds were loud, and in 1 of these the pulmonary sound was reduplicated. From careful observation he is convinced that in cases of perityphlitis accentuation of the second pulmonary sound is a frequent symptom, though he is unable to account for it. It is well known that Skoda first recognized pulmonary accentuation in mitral disease, and that it is an indication of high pressure in those affections in which there is increased resistance to the work of the right ventricle. Interference with the pulmonary circulation due to the elevation of the diaphragm through increased volume of the abdominal contents, as in meteorism, ascites and the like is also a matter of common experience; and in this way also pulmonary accentuation may be produced. Dr. Mannaberg believes that the rise of blood-pressure after a meal is at least in part due to the same cause, and not, as Potain maintains (*De la dilatation du coeur; la medecine moderne*, November 26, 1892), to a reflex contraction of the lung capillaries, resulting from digestion. In the 10 positive cases recently observed by the author there was no distention of the abdomen, and consequently no undue pressure on the diaphragm; indeed, marked meteorism is rare in uncomplicated cases of perityphlitis. There was no dyspnoea, and the other symptoms, such as pain and pyrexia, would not account for the accentuation, which lasted after the acute stage, and was present even when the patient was recovering. Further observation is necessary to determine whether the symptom is generally present in perityphlitis and other abdominal affections, and whether it is of any special value in diagnosis.

—*Practitioner*.

An Extreme Case of Ascites.—C. C. Cotton, of Point Isabel, Ind., relates the case of a patient who died recently,

a man of 51 years, who had suffered from ascites for three and one-half years. The following table will show the progress of the disease, and the increase from year to year in the frequency of tapplings:

Time.	Number of times tapped.	Average quantity of fluid.	Total quantity of fluid.
6 months	7	30 pouuds.	210
1 year	34	27 “	918
1 “	55	21 “	1155
1 “	71	18 “	1278
<hr/>			<hr/>
3½ years	157		3561

In addition to the extraordinary severity and duration of this case, what is possibly more remarkable is that the patient soon became familiar with the operation and could perform it himself, which he did with his own hands more than one hundred times.—*Medical World*.

How to Give Pills to Children.—Bond, in the *Virginia Medical Monthly* for July, 1894, states that the inability of smaller children to swallow pills without chewing them up renders the administration of certain ill-tasting drugs to such patients very difficult, and really in many cases becomes a very hindrance to necessary treatment.

This fact is especially striking when we consider the treatment of malarial fevers in small children by means of quinine. The hypodermatic method and administration by the rectum are too unhandy for general use. Application through the unbroken skin is too uncertain and inconvenient. The drug must be given by the mouth in nearly all cases, or not used at all. Solutions of quinine or acidulated water are, indeed, most efficacious in the cure of the disease, but the philosophy of the Stoics has not yet become a fad among the grown folks of America, and we need not expect children to practice its teachings. Quinine may be dissolved in tincture of iron, and, when syrup is added, the combination of nasty things will sometimes be taken without much objection by older children; but iron is often unnecessary or contra-indicated in these cases.

The administration in bulky mixtures of substances which cover the taste of the drug is open to grave objections, for it may well be questioned whether the large quantities of liquorice, yerba santa, chocolate, etc., are not positively injurious in many cases to the already enfeebled stomachs of young patients, or even of older ones, ill with severe malarial diseases.

Tablets of chocolate containing definite quantities of tannate of quinine have found some favor with physicians and are greatly enjoyed by certain children. They, however, are open to the objection that tannate of quinine is not a sufficiently active preparation of the drug to warrant reliance upon in severe cases.

With some confidence of receiving an attentive hearing, the author recommends a method he has found efficacious in his own practice. The quinine sulphate is ordered in pill form with dilute acid, generally aromatic sulphuric acid, and the mother of the patient is directed to break up each pill and mix with a little brown sugar. This is put upon the tongue dry, and a mouthful of water carries it into the stomach; sometimes sweet chocolate is broken up and used instead of brown sugar, or it is taken into the mouth before and after the bits of quinine pill and sugar. A stick of liquorice root may be used in the same way. In this way a very little of the masking substance suffices at each dose. The pill of quinine sulphate made with aromatic sulphuric acid is not only very soluble, but also in its smallest possible bulk.

It will readily be seen that by means of the pill broken with brown sugar or other masking agent, any drug or mixture of drugs which can be made into pilular form may be administered to children with facility. Since it occurred to the author to try this method he has never felt the need of mask mixtures for such prescriptions. Moreover, the mothers of the children take kindly to the plan.—*Therapeutic Gasette*.

The Dangers of Thyroid Extract.—Dr. W. D. Janes reports in the June number of the British Journal of Dermatology a case of glycosuria caused by thyroid extract given for the relief of psoriasis. The patient was a medical man, had taken the extract in small doses for some time without effect upon the disease, and then increased the dose quite suddenly. At the end of a week he began to suffer severely from depression, with frequent flushings and palpitations. The nervous symptoms increased, and the patient felt and looked an old man. Before another week elapsed his thirst became unquenchable; the quantity of urine greatly increased, the breathing became embarrassed, the pulse 120 to 132 per minute, and the smell of acetone was detected in the breath. The urine had a specific gravity of 1,032, and sugar was freely found by all tests. The thyroid treatment was at once stopped, and diabetic diet adopted, with the result that the quantity of sugar decreased daily, and disappeared entirely in a few days. No improvement was noted in the psoriasis. —*Medical Record*.

A Climatologic Investigation by the United States Government.—The influence of climate both in the production and in the treatment of diseases has long been recognized, and we are glad to learn that an earnest and systematic effort is about to be made under the auspices of the United States government, through the weather bureau of the Department of Agriculture, to gather such data as must ultimately prove of the greatest value to sanitarians in the selection of places of residence with a view to the prevention and cure of disease. The work has been placed in the hands of Mr. Mark W. Harrington, the efficient Chief of the Weather Bureau, who has already in many ways manifested an active interest in the subject of sanitary climatology.

In the official announcement it is pointed out that the study of the climates of the country in connection with the indigenous diseases should be of material service in every community, in showing to what degree local climatic peculiarities may favor or combat the development of different diseases,

and by suggesting, in many instances, supplementary sanitary precautions, also by indicating to what parts of the country invalids and health seekers may be sent to find climatic surroundings best adapted to the alleviation or cure of their particular cases.

The hearty co-operation of the various boards of health, public sanitary authorities, sanitary associations and societies, and of physicians who may feel an interest in the work, is asked, to the end of achieving and perfecting the aims of this investigation.

It is proposed to send, free of cost, the publications of the bureau bearing upon climatology and its relation to health and disease to all those who assist in the work.

Co-operation will consist in sending to the office of the chief of the Weather Bureau of the United States Department of Agriculture, at Washington, D. C., reports of vital statistics from the various localities. That these reports may be of value, they should be accurate and complete, and be rendered promptly and regularly. Accordingly, blank forms of reports have been prepared so as to occasion as little trouble and labor as possible on the part of the reporter, and will be furnished by the Bureau on application. It is pointed out that at the very beginning of the investigation it is not possible to outline precisely the channels through which the results obtained will be made public, but it is hoped to publish soon a periodical devoted to climatology and its relations to health and disease. The publication will probably resemble in size and general appearance the present Monthly Weather Review, the subject matter being, of course, different. — *Medical News*.

Aristol in Cancer of the Stomach. — Dr. Henri Huchard (*Journal des Practiciens*, 1894, *Americ. Journ. of The Medical Sciences*, Dec. 1894) uses Sodium Chlorate in daily amounts of from 150 to 180 grains dissolved in from 5 to 7 ounces of water, not as one, but in individual doses, so that a continuous topical action may be maintained, not only upon the tumor but also upon the gastric mucous membrane. If the larger

dose is surpassed symptoms of gastric irritation supervene and vomiting, and the remedy can no longer be borne. To definitely state if this be a curative agent many years of observation are needed; it can, however, be definitely stated that sodium chlorate in large doses has a favorable action upon functional disturbances of the stomach. It increases the appetite, diminishes pain, makes the vomiting of food to disappear, and causes the haematemesis to cease. Aristol has been found to be inferior to sodium chlorate, but is useful, if the stage of ulceration has been reached, because it appears to possess local action in the digestive canal when given in pill form in doses of three or four of one and one-half grains each daily. These remedies should be used at least, because they relieve the functional disturbances.

The Medical News Visiting List for 1895.—Weekly (dated, for 30 patients); Monthly (undated, for 120 patients per month); Perpetual (undated, for 30 patients weekly per year); and Perpetual (undated, for 60 patients weekly per year). The first three styles contain 32 pages of data and 160 pages of blanks. The 60-Patient Perpetual consists of 256 pages of blanks. Each style in one wallet-shaped book, with pocket, pencil and rubber. Seal Grain Leather, \$1.25. Philadelphia: Lea Brothers & Co., 1894.

The Medical News Visiting List for 1895 has been thoroughly revised and brought up to date in every respect. The text portion (32 pages) contains the most useful data for the physician and surgeon, including an alphabetical Table of Diseases, with the most approved Remedies and a Table of Doses. It also contains sections on Examination of Urine, Artificial Respiration, Incompatibles, Poisons and Antidotes, Diagnostic Table of Eruptive Fevers, and the Ligation of Arteries. The classified blanks (160 pages) are arranged to hold records of all kinds of professional work, with memoranda and accounts. The selection of material in the text portion and the arrangement of the record blanks are the result of ten years of experience and special study. Equal care has been bestowed upon the mechanical execution of the book,

and in quality of paper and in strength and beauty of binding nothing seems to be left wanting. When desired a Ready Reference Thumb-letter Index is furnished, which is peculiar to this Visiting List, and which will save many-fold its small cost (25 cents) in the economy of time effected during a year. In its several styles, The Medical News Visiting List adapts itself to any system of keeping professional accounts. In short, every need of the physician seems to have been anticipated in this invaluable pocket companion.

Bone Marrow in Treatment of Pernicious Anemia.—

Dr. Thomas R. Fraser, in the *British Medical Journal*, has a very interesting article on the results obtained in pernicious anemia by giving bone marrow. The patient was a gardener, aged sixty years, and had the symptoms of frequent vomiting and diarrhœa, edema of the feet and ankles, moderate and irregular pyrexia, dimness of vision, retinal hemorrhages, dyspnoea, and latterly, complete prostration. The hemocytes of the blood varied from 1,860,000 to 1,460,000 per cubic millimeter, and the hemoglobin from 27 to 30 per cent., the specific gravity being 1038. There was great distortion in the shape and variation in the size of the hemocytes, which did not form rouleaux. Retinal hemorrhages were present in both eyes. The ordinary treatment of iron and arsenic was instituted and the examination of the blood showed further deterioration. In the fifth week ox-bone marrow was given by the mouth, uncooked, three ounces daily, in addition to the medicines. A rapid improvement ensued. The patient soon recovered strength and body weight, could remain out of bed, and appetite was better. At the end of about four months the hemocytes remained at about 3,400,000, the hemoglobin averaged 70 to 75 per cent., and the specific gravity 1059. The patient felt strong and enjoyed doing light manual work. He had no subjective symptoms, and the "hemic," venous and cardiac bruits were no longer audible. After eight months treatment, the patient was discharged to return to his occupation as a laborer. The hemocytes were nearly uniform in size, only a few of them showing a slight

“tailling,” and no mengalocytes were present. There was no excess of the leucocytes or of blood plates, and good rouleaux were formed on the microscopic slide. Inasmuch as it has been demonstrated by physiologists that the colored blood corpuscles are derived from the large, pale cells in the red marrow of the bones, especially in the ribs, Dr. Fraser's treatment is especially happy in theory, and apparently successful in this one case.—*A. M. Practitioner.*

Is Cycling Healthy?—It must be most annoying to the enthusiasts of the cycling community to read the public comments that are just now being made on their favorite exercise. The press all through the country is full of the question, “Is cycling healthy?” and of the answers that spring from it. We assume that those who, for the moment, are so interested and eloquent on the subject, have not read the moderate observations we, from time to time, have made upon it; if they had, there would not be the same agitation or the same string of contradiction. This is not a case in which it can be said that in a multitude of counsellors there is safety. It is a case where a few individuals looking on the whole facts with professional and unbiased minds can do the most good that can be expected. It has never been our business to endeavor to master the problem in this form, and in the honest attempt so to do, we have sometimes offended the ardent cyclist, and sometimes, also, have run the risk of offending his ardent opponent. The facts are that the offense comes out of duty and must be borne by ourselves, and those sober-minded people who wish to see both sides of a matter that has to it two sides at least. There, three sets of opinions, among those who have ridden, or do ride; the cyclist, as to the effect which riding has on them individually. It is clear that there are some who cannot ride; from the first, exercise does not suit them; from the first, it wearies them in mind as well as in body. They try, often under disadvantageous circumstances, overwearied with mental or bodily work, or suffering from those symptoms of disease, and not unnaturally, these discover that what they supposed might be for their benefit is just the reverse. Their nervous centres are shaken, their muscles are tired and strained, their heart is wearied. If they had gout or rheumatism the latent malady comes out. In a short time they show the bad effect

of the exercise, and not liking to say anything by halves, and not believing they could have done any thing for which they are specially unfitted, they are severe in their criticism and condemn a general system on the ground of their own idiosyncrasy. On the other hand, there are men and women of all ages, who, entering the cycling fraternity, find a pleasure and a relief in it which are quite phenomenal, and though it may not last, are sufficient to make them feel that they must hold by the new acquirement, patronize those who excel in it, praise its many and obvious advantages, and by imperceptible means become on their part warm and perhaps able, if not altogether, sincere supporters of it. Lastly, there is a third set to whom cycling becomes a business. For the sake of saving time, or of carrying loads, or other useful task, they train themselves into cycling labors, and cycling habits become without offense, cycling animals, and find they can perform labors otherwise impossible, with comparative immunity from injury. The evidence which men of science alone accept, lies between these three sources, the last probably affording the best; and the evidence is to the effect, that excluding those who are not fitted by constitution to ride at their own physical and mental expense. Cycling is as safe as any other exercise if it be taken in a moderate and common-sense manner.—*London Lancet*.

The Oyster as a Medium of Transmitting Typhoid Fever.—If current reports can be relied upon, an epidemic of typhoid fever among the students of a New England university has been traced to the ingestion of raw oysters taken from an infected stream. All of the victims had partaken of raw oysters supplied by an oysterman who was in the habit, after taking the oysters from the deep waters, of placing them some twenty-four hours in the shallows of a river passing near his house. On investigation it was learned that the oysterman's wife had died of typhoid fever at about the time of the epidemic among the students, and that a daughter was also ill with the disease. The drain of the house emptied into the river at a point where the oysters were placed temporarily. In addition to the students, a number of visitors were also attacked. If the statements cited can be verified, they will have a good deal of significance, and will exert a profound influence on an important industry. On the other hand, it is but right that they should be corrected if they prove false. — *Medical News*.

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NOTE ON MALT EXTRACTS.

BY WILLIS G. TUCKER, M. D.

The value of malt-extracts, whether employed as food-adjuncts in health or as remedial agents in disease, depends not so much upon the nutriment which they directly supply, as upon their power of dissolving starchy substances which make up a large, and an important, part of ordinary food, and transforming them into assimilable dextrins and maltose. This transforming power is due to the action of diastase, an enzyme possessing similar properties to the ptyalin of saliva and the amylopsin of pancreatic juice. By its aid the digestion and assimilation of starchy foods even by infants may become an easy matter, and in the treatment of aged or enfeebled persons and invalids, preparations containing active diastase are of the greatest value. Even the *normal* digestion of food is facilitated by such preparations, for the majority of well-fed persons consume a larger quantity of food than the system requires and thus unnecessarily overtax the digestive apparatus.

Many liquid malt-extracts are offered for sale and these preparations are very largely prescribed by physicians. The claim is made for most of them, either directly or by implication, that they contain diastase and aid digestion by transforming starch. With a view to determining the activity of some of these preparations in this direction a series of experiments was undertaken in which tests were made of "Maltine with Coca Wine," a preparation recently introduced and largely employed, and of half a dozen well known liquid extracts of malt. The experiments were performed as follows: Uniform glass flasks of adequate size, each closed with a cork through which a thermometer was passed, were provided, and 250 c. c. of a smooth paste of gelatinized starch (Bermuda arrowroot) was added to each. The flasks were placed in a water-bath, the temperature of which was maintained at 99° to 100° F., during the course of the experiments, and when their contents had in each case acquired this temperature 2.5 c. c. of each of the several samples was added to the starch in as many separate flasks and agitated therewith to secure thorough admixture. The samples used were original packages, bought in the open market, and all were in good condition when opened at time of making the tests.

Before stating the results obtained it may be well to call attention to the nature of the action of diastase upon starch. Gelatinized starch is first rendered soluble by this enzyme so that when iodine is added to the solution a clear blue liquid results and no precipitation of particles of iodide of starch takes place. As the action proceeds the starch is transformed into a number of erythro-dextrins and acroo-dextrins, the former giving a reddish color, and the final product producing no color, with iodine solution. As the action continues, more or less complete conversion of these dextrins into maltose takes place. It is not possible to determine with precision the exact amount of the different dextrins and of maltose which are thus produced, but a careful test with iodine indicates pretty accurately the degree of conversion. In these

experiments the iodine test was made in the following manner. A solution containing one gram of iodine and two grams of potassium iodide in 100 c. c. of water was prepared, and of this solution three drops were added to 100 c. c. of water contained in a beaker glass standing upon a white surface. Three drops of the solution to be tested were then added and the color and transparency of the liquid noted. This method, recommended by Professor Haines, is far superior to any other, and much exceeds in delicacy and accuracy the ordinarily employed test in which a strong solution of iodine is added to a drop of the liquid to be tested upon a white plate. Now it will be found that if no liquefaction or solution of the starch has taken place, on adding three drops of the fluid to the weak iodine solution, a blue liquid results from which the iodide of starch in finely divided particles precipitates. If the starch has been rendered soluble the liquid will be deep blue and perfectly transparent, and as transformation proceeds, and successive tests are made, the color changes from blue to purple, and then to amethyst, reddish-brown and brownish, and finally, when conversion is complete, the yellowish tint of the iodine solution remains unchanged on addition of the transformed solution.

In the tests of "Maltine with Coca" Wine and the six liquid extracts of malt, made as above described, the six liquid extracts caused no liquefaction of the starch nor transformation of the same at the end of two hours. A further addition of ten c. c. of each of these extracts was then made to the flasks in which each had been tested and they were kept at constant temperature for two hours longer, at the end of which time each showed the presence of insoluble and unconverted starch and no evidence of transformation into dextrin or maltose. The Maltine preparation alone dissolved all the starch and had converted it into soluble and assimilable dextrins at the end of twenty minutes. At the end of forty minutes conversion into acroo-dextrin and maltose was practically complete, and at the end of an hour the starch was entirely

transformed. The liquid malt extracts must therefore be considered as practically without any diastatic action, while the preparation of Maltine in one fifth the quantity and in one twelfth the time exerts such action powerfully.

In order to determine the proportion of starch which "Maltine with Coca Wine" was capable of dissolving and transforming a series of tests was made in which different quantities were added to the same volume of gelatinized starch (3%). It was found that one part of this preparation with ten parts of starch left no unconverted starch at the end of an hour at a temperature of 99°–100° F., and that at the end of three hours conversion into acroo-dextrin and maltose was practically complete. Indeed it was found that one part would satisfactorily digest fifteen of starch in that it will convert this amount into readily assimilable material at the bodily temperature and in three hours time.

A still further test was made to determine the proportion of maltose formed by the action of this Maltine preparation upon an excess of starch. For this purpose 0.25 grams was added to 250 c. c., of a three per cent. gelatinized starch, being in the proportion of one part to thirty of starch, and kept at a temperature of 99°–100° F. for three hours. At the end of this time further conversion was checked by the addition of two c. c. of a ten per cent solution of caustic soda; the fluid was diluted to 500 c. c., and the sugar determined as dextrose by Fehling's solution. From the amount of sugar thus found was deducted the quantity present in the preparation used in the test which had previously been determined, and the remainder, determined as dextrose, was calculated as maltose, the reducing power of which is two-thirds that of dextrose, and found to be 0.9072 grams. Therefore one part of "Maltine with Coca Wine" will produce 3.63 parts of maltose (or its equivalent in reducing dextrins or saccharine matter) in presence of an excess of starch at the end of three hours and at the temperature of the body. This experiment and those previously described abundantly illustrate the diastatic value of this preparation.

Report of One Hundred and Forty-Five Operations Done for Removal of Ovarian Tumors and Pathological Conditions Associated with the Ovaries and Uterine Appendages Only.

By

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An abstract of this paper was read at the meeting of the American Association of Obstetricians and Gynecologists, Toronto, Canada, September 19th, 1894.

In presenting this report in abdominal surgery, with accompanying table, I desire to state that the one hundred and forty-five cases do not include any of my work in supravaginal hysterectomy, excepting Nos. 112 and 114, cases complicated with ovarian tumors, or solid tumors of the ovaries or broad ligaments, cases of hystero-epilepsy, cases of tubercular peritonitis, of gall-bladder surgery, of appendicitis; or of any operations whatever within the peritoneal cavity, previously reported by myself in former papers, with one exception, case 42. The operations here reported were done for removal of ovarian tumors and pathological conditions associated with the ovaries and uterine appendages. It is true that some of the cases were simple tubercular peritonitis, in which the appendages were not removed, but the history of the case, in each instance, and direct physical examination, gave some little question as to whether there might not be an ovarian complication with the suspected tubercular trouble.

I realize that my work is far from being as successful as I could have wished, and yet, in a personal, critical retrospection of the causes of death, I feel that I have gathered an experience that will be to the benefit of my future patients,

and I trust somewhat to those of my associates and successors who may continue to do this line of work.

CASE I.—Mrs. C. C., duration disease two years; history of several attacks localized peritonitis, accompanied by vomiting.

Operation February 20, '88, revealed multilocular ovarian cyst, papillomatous in character; some adhesions; broad pedicle; Tait knot. Patient did well for forty-eight hours, then began to vomit, showing marked evidence of intestinal obstruction, which continued unrelieved. Died on third day. Autopsy revealed obstruction due to loop of small intestine having attached itself to stump of pedicle.

CASE III.—Mrs. F. C., operation April 9, '88, revealed multilocular ovarian cyst, with sarcoma of mesentery—latter ligated separately and removed. Uterine appendages also removed. Drainage. Patient in good condition of health six months after operation.

CASE IV.—Miss C. D., maternal grandfather died of cancer. Menstruated at fourteen; scanty and painful; severe amenorrhœa and dysmenorrhœa since. Four years previous, after a severe fall and cold, had pelvic peritonitis. Leucorrhœa always very severe. Suffered from general pelvic pain, and unable to perform household duties, much of the time being a confirmed invalid. Operation May 31, '88, showed adhesions quite marked, right ovary enlarged, and tube much thickened, left ovary undergoing cystic degeneration, tube not so much diseased as right one. Stitch-hole abscess on sixth day. Finally good union, patient discharged on twenty-fourth day after operation.

CASE VI.—Mrs. A. M., mother, two paternal and two maternal aunts died of phthisis; maternal cousin had abdominal tumor. Personal history very good. Married at sixteen; two children; one miscarriage; youngest child twenty-eight years old. Seven years previous to operation noticed some trouble in left iliac region; dull pain and soon after side began to enlarge. Five years later menstrual periods became irregular and later still legs became cedematous. Examination urine showed no disease of kidneys. Abdomen measured forty-two inches in circumference about umbilicus. Operation May 31, '88. No adhesions. Weight of cyst and fluid thirty-five pounds. Patient in much pain after operation and given one-quarter grain morphia, hypodermatically, every six hours for first day, after which it was discontinued. Bowels moved second day; superficial stitches removed fourth day; deep ones fifth day; wound healed by primary union. Without any assignable cause temperature third day rose to $102\frac{1}{2}^{\circ}$, within few hours returning to nearly normal, after which patient made uninterrupted recovery, and discharged on twenty-third day.

CASE VII.—Mrs. A. O'C., family history good. Never had severe illness; menstruated at twelve, which was and always has been painful, but normal in quantity and general appearance. During September, '87, first noticed pain and tenderness in right iliac region. Pain dull, burning variety, and seemed to extend gradually upwards. Four months later noticed enlargement left side, gradually increasing in size, patient measuring thirty-four inches in circumference. Two week previous to operation had severe, paroxysmal pain in left inguinal region, especially severe upon deep inspiration—continuing

for ten days. Menstrual periods regular during growth of tumor and less painful than before. Bowels habitually constipated, except two weeks previous to operation. Operation May 31, '88, revealed large, multilocular ovarian cyst, connected with left ovary and tube, having many adhesions to bladder and intestines, which were relieved without great difficulty by means of pressure of hot sponge, proving them to be of recent origin, probably outgrowth of recent peritonitis. To deliver cyst required breaking up of very many smaller cysts through original opening in larger cyst. Right ovary undergoing cystic degeneration and removed. Abdomen thoroughly flushed with hot water. Weight cyst and fluid twenty pounds. Fluid thick and gelatinous, and portions escaping into abdominal cavity made irrigation necessary. Patient given few hypodermic injections of morphia first twenty-four hours to relieve pain. Superficial stitches removed third day, deep on fifth, wound thoroughly healed. Evening eighth day, after evacuation bowels, patient had severe chill, followed by temperature 102° with profuse sweating. No abdominal tenderness, but hard, indurated mass could be felt about lower end incision. Warm applications used, and five grain doses quinine given every four hours. On evening of tenth day about one ounce of black, tarry fetid substance discharged per vaginum, vaginal douches being used after that each day. Temperature fluctuated between 102° and $104\ 4-5^{\circ}$ degrees for thirty-six hours, but decreased on eleventh day, and on twelfth normal—no suppuration of wound. Indurated mass in region incision entirely disappeared and from this time on patient made an uninterrupted recovery, being discharged on twenty-fourth day.

CASE VIII.—Mrs. P. A. R., paternal grandfather died of cancer; paternal aunt of phthisis pulmonalis, otherwise family history good. Menstruated at thirteen, regular up to fifty-two, except during pregnancy and when nursing children. Two children; two miscarriages. Patient first noticed small enlargement left side abdomen two years previous to operation, painless and increased in size very slowly until April, '88, when it grew rapidly and became somewhat painful; much inconvenience in getting about; circumference at navel forty-one and one-half inches. Operation July 5, '88, revealed double ovarian cyst; right nearly unilocular, tapped, removed without much difficulty, although some adhesions to intestines. Cyst left ovary adherent to omentum, giving rise to considerable hemorrhage, requiring several ligatures; weight, cysts and fluid, forty-two pounds. Patient had quite severe mitral stenosis, but bore anæsthetic very well. Stitches removed fifth day; patient made good recovery and discharged on twenty-first day.

CASE IX.—Miss E. B., family history very good. Patient suffered many attacks of pelvic peritonitis. Operation October 1, '88, revealed double pyosalpinx; many and firm adhesions; operation very difficult; removal uterine appendages. Good recovery. Two years later patient died from what, at that time, was supposed to be sarcoma of cavity of pelvis.

CASE X.—Miss M. W., aet twenty, good family history. Unilocular cyst; uncompleted operation. After operation no symptoms presented to cause anxiety, except as to pulse rate, not going below 100, tenth day increasing in frequency, and patient showed a nervous, agitated state, although bowels had moved properly, etc., but she gradually sank and died on fourteenth day.

Autopsy revealed large number of clots in pelvis, same condition had extended up into abdominal cavity, particularly in right lumbar region, clots undergoing septic change, but no pus present; ligature was found loosened and discovered to have come from stock of imperfectly prepared silk, none of it being used afterwards. In this case I believe had there been no internal hemorrhage, or, when it presented, had I opened up, washed out, thoroughly controlled bleeding vessels and drained, she might have recovered; yet at no time was there shock enough to indicate this procedure warrantable.

CASE XI.—Mrs C. W., family history of phthisis. No children; one miscarriage 1880. Regular menstruation until August 4, '88, when it ceased. May '88, after hard day's work, taken with severe pain, crest right ilium, lasting fifteen hours; enlargement presented afterward. Diagnosis of ovarian tumor; tumor enlarged rapidly—tapped October '88; patient afterward suffered from occasional attacks biliary colic and swelling of right leg. Operation, November 19, '88, revealed large multilocular cyst, from left ovary, containing variety of colored fluids, ranging from light to dark, dirty greenish appearance. Cyst contained papillomatous growth; right ovary healthy, not removed. Operation protracted, as hard, solid portions of tumor rested over right kidney and iliac vessels, undoubtedly, from pressure, causing swelling of leg on that side; drainage for about forty-eight hours. Excellent recovery and patient discharged twenty-second day.

CASE XII. — Mrs. H. T. T., family history decidedly cancerous. Four children; one miscarriage, seventh month. Menstruation normal. After birth second child, solid tumor, size of cocoanut, developed in left lumbar region, disappeared under treatment, appearing again at birth of third child, disappearing after delivery; patient at this time very ill; constant vomiting for a week, with suppression of urine; however, made very good recovery. No trouble fourth pregnancy; at fifth, had post partum hemorrhage. Three years previous to operation began to enlarge slowly for eight months, when on rising one morning, growth had disappeared, doing this several times since. About that time tapped twice, at intervals of a week. Operation, December 21, '88, revealed tumor springing from left ovary, cyst holding twelve quarts of fluid. Many adhesions. Operation difficult. Several silk ligatures applied within abdominal cavity. Right ovary also removed. Uninterrupted recovery, discharged on twentieth day.

CASE XIII.—Mrs. H. M. R., family history of phthisis. Six years previous to operation delivered of still-born child. Health not good since. Menstruation regular, but always painful. Took fifteen to twenty grains chloral nightly. Three years previous to operation treated fifteen weeks by Dr. Emmett, in Woman's Hospital, for ovarian trouble and anteversion. After return home husband continued use of tampons, cotton and glycerine, but no improvement, and patient confined to bed four months. Diagnosis, double salpingitis, confirmed by operation December 22, '88. Some vomiting and continued pain in back after operation, otherwise good recovery, and discharged thirtieth day.

CASE XV.—Mrs. N. M., family history good. Menstruation normal. One child, three years old; one miscarriage. First noticed distension of abdomen one year previous to operation, and was treated for ovarian dropsy and lung

trouble by Dr. Woodward, of Vermont, for some time. Operation revealed ascitic fluid, peritoneum studded with small papillæ, giving somewhat the appearance of warts on a toad's back. Condition concluded to be one of tubercular peritonitis. Right ovary enlarged and removed. Masses afterwards proved to be tubercular in character. Glass drainage, which gave her much discomfort, was removed on fourth day and replaced by soft rubber tube. This removed on twelfth day, drainage having ceased entirely. Patient made an uninterrupted recovery and remained in good condition afterwards. One point of interest presented in her case, i. e. regarding glass drainage tube not being turned and raised each day by the nurse, its becoming quite firmly attached in position and removed with some difficulty. Patient discharged on twentieth day.

CASE XVI.—Miss I. R., aet twenty-six. Family history only fairly good. Suffered from dysmenorrhœa, and severe, well marked attacks pelvic peritonitis. Feeble and emaciated when I saw her with family physician, with great effort continuing her work, that of bookkeeper in large store. Had continued indigestion with vomiting. Case evidently one of salpingitis, and probably double pyosalpinx. Cœliotomy April 5, '89. Many firm adhesions, difficult to separate, but removal appendages completed. Pelvis left in good dry condition. Patient vomited from time of operation, at last a spinach-like substance. No distension abdomen; bowels moved safely, no symptoms obstruction, but patient died from inanition on eleventh day. Autopsy showed evidence general peritonitis. Careful going over of technique of operation and surroundings failed to show any evidence of error.

CASE XIX.—Mrs. F. W., family history good. Menstruated at fourteen; married at fifteen; fourteen months later delivered of living child at seventh month; premature delivery caused by boy jumping on abdomen; second delivery normal and child still living; one miscarriage since at third month; menopause at forty-eight. Oct. '88, operated on by Dr. Boyd for prolapse of uterus; no evidence of tumor at that time; thinks growth since to have been occasioned by resting filled coal scuttle upon left ovary at times for past six years. Dec. '88, observed aching pain in this region; some bloating and felt ill all winter; blisters and hot applications used; first noticed enlargement, size of goose egg, in Feb. '89; examination in May gave all the symptoms of ovarian cyst. Operation June 15, '89; diagnosis confirmed; cyst removed; quite a number of adhesions; drainage; recovery, followed by hernia some six months afterwards.

CASE XX.—Mrs. B. A., aet twenty-two, family history of phthisis. Met with injury May, 1888, following October abdomen enlarged; tapped April 18, '89, fifty pounds of fluid drawn; circumference at umbilicus forty-four inches; though desperately ill yet she and her friends were very anxious for an operation. Cœliotomy August 22, '89; time required one hour and thirteen minutes; very extensive and firm adhesions of sac to peritoneum; much hemorrhage; multilocular cyst, left ovary removed; right ovary enlarged, with evidence of another cyst developing, also removed; glass drainage; every effort made to bring patient out from condition of shock, but she died four P. M., August 30. Autopsy revealed no hemorrhage within peritoneal cavity. Case probably hopeless from beginning and illustrates the seriousness of delay and evil results of tapping.

CASE XXI.—Mrs. E. B., widow, aunt died cancer of tongue, otherwise history good. Menstruated at sixteen; regular without pain; married at seventeen; three children; two miscarriages; menopause at forty. One year previous to operation abdomen began to enlarge and gave some distress on motion. Jan. '89 could feel good sized tumor in left side which she could steady with hand when turning in bed. March, '89, tumor tapped but no fluid withdrawn. Six weeks previous to operation tumor grew more rapidly. Twelve days before operation Dr. Fuller aspirated left side and drew off small quantity of what seemed to be purulent fluid. Weighed 135 pounds year before operation. Emaciated, anæmic, bowels regular, appetite very good, urine scanty, pulse 128, temperature 99, measured 47 inches about navel. Diagnosis multilocular ovarian cyst. Operation Sept. 23, '89; diagnosis confirmed; scarcely any adhesions; large cyst filled with colloid material; ovaries removed; drainage; patient making good recovery.

CASE XXII.—Mrs. C. L., family history of phthisis; mother three children; one miscarriage; strong and healthy as a girl; menopause at forty-five. March, '89, after very hard work noticed enlargement left side abdomen; filled rapidly and tapped in July; one half gallon fluid removed; tapped again August 16, nearly same amount fluid. First tapping fluid had bloody appearance, second purulent. Had attack of what was called bilious vomiting Sept. 28. Appetite good, bowels inclined to diarrhœa; legs enormously swollen, at times discharging serum. Operation Oct. 14, '89; adhesions of sac to peritoneum very decided. When trocar was introduced there escaped a greenish looking fluid. Introduction of hand into opening of sac became necessary and a material looking like custard or omelette was scooped out; sac carefully separated from peritoneum, such vessels ligated as became necessary, peritoneal cavity irrigated with hot water, drainage tube inserted, and incision closed; patient vomited almost constantly for first forty-eight hours, finally ceased; drainage quite free, glass tube removed end fifth day, rubber substituted, left in but few days longer; patient made excellent recovery.

CASE XXIV.—Mrs. M. B., patient has three living children, youngest eleven years old. Menstruation regular from fourteen up to forty-three, when she flowed every two or three weeks. In Dec. '88 first noticed slight enlargement on left side; during last six months has enlarged more rapidly, pelvic cavity free from deposits; uterus freely movable. Operation Oct. 29, '89; ovarian cyst tapped and mucilaginous dark-colored fluid drawn off. Several adhesions found on left side; as sac was drawn out it was found to be multilocular; sac lifted out en masse and small pedicle ligated; patient recovered rapidly.

CASE XXV.—Mrs. R. H., family history good. Menstruated at fourteen; two children, no miscarriages; youngest child ten and oldest eighteen years old; since birth of first child suffered from pelvic pain, especially severe at menstrual epoch; pain feels as if bands were being tightened around the intestines. Not free from pain for eighteen years. Operation Mar. 4, '89 showed both ovaries bound down by strong adhesions; nothing further done than to loosen adhesions as much as possible; impossible to isolate ovaries; abdominal wound sutured in usual manner, glass drainage; patient made good recovery.

CASE XXVII.—Mrs. D. S., mistaken diagnosis; supposed large ovarian cyst. Coeliotomy November 14, 1889, revealed tubercular peritonitis; ascites; one ovary removed; improved; patient died later on of return of peritoneal dropsy.

CASE XXVIII. — Mrs. S. N., menstruated at eleven. Not regular. Flow would cease for seven weeks or two months. Has five children. Three miscarriages. Youngest child three years old. Two years ago noticed enlargement in right ovarian region. April, '89 began to flow excessively, and on one occasion flowed steadily for two months. Enlargement gradually increased. Operation Dec. 5, '89. Ovarian tumor. Chill on fourth day, controlled by quinine. Cyst fluid twenty-two pounds. Uninterrupted recovery.

CASE XXIX.—Mrs. H. N., family history good; delicate as a girl. Menstruated at twelve; dysmenorrhœa always; three children; no miscarriages. Flowed excessively at times, more since marriage; suffered every month during pregnancy. Since birth last child — two and one half years old — pain more or less daily, sharp, stabbing, radiating from ovarian regions, down thighs and through back. Bowels regular; appetite good. Operation Jan. 27, '90. Left ovary, with tube, enlarged and removed. Right also removed. No drainage. Vomited once after operation. With exception of sharp pain and nausea no untoward symptoms. Stitches removed on fourth day; no suppuration. Partook regular diet fourth day. Uneventful recovery.

CASE XXX.—Mrs. A. McK., first trouble two years ago, thrown from carriage, followed by constant pain in dorsal, lumbar and sacral regions. Urination painful. Inflammation of uterus diagnosed. Severe pain pelvis and hip. Confined to bed. Improved somewhat but unable to walk. Recurrence of trouble in August. Physician diagnosticated cystitis and washed out bladder but attended with such severe pain, discontinued. Improved sufficiently to be brought to hospital Dec. 2, '80. Galvanism applied, pain decreased somewhat but back became so sensitive, current discontinued. First menstruated at thirteen — exposed to cold shortly before second menstrual epoch due and flow absent one year. On return, so painful, often confined to bed. Between August 4 and December 9, flow absent. Paroxysms of pain at time when flow would have naturally appeared. Since December up to date nothing appeared. Laparotomy and double oöphorectomy February 23, '90. Extensive adhesions of ovaries and tubes, small cyst on right side. Patient did well, received two hypodermics of morphia up to Friday night when was taken with severe attack resembling hysteria — husband had been visiting patient — did not rally for several days and kept under the influence of morphia at times. After this recovery uneventful. Stitches removed March 5.

CASE XXXI.—Mrs. E. H., always delicate as a child. Menstruated at twenty. Monthly pains previously, but no flow. Menstruation painful, patient having to go to bed. Flow sometimes lasted ten days, at times occurring every three weeks. Two living children—seven or eight miscarriages. First child born at seventh month. Second at full term, but labor difficult—instrumental. All miscarriages occurred after this labor and all without any known cause; patient treated for some uterine trouble for past twelve years; in '89 fell on sidewalk hurting left side quite badly; after fall lost flesh rapidly—eighteen

pounds in one month; before this felt quite well; one month later noticed enlargement in left ovarian region, about size of an orange; painful for about two months, then pain ceased for a time, but is now present; growth not rapid; at times sensation like fluid moving from side to side of tumor when in bed. Operation for ovarian cyst performed April 22, '90. Cyst removed, drainage—recovery.

CASE XXXII.—Mrs. J. V., cœliotomy April 30, '90. Multilocular ovarian cyst; previous peritonitis; removal cyst and both ovaries. The adhesions in this case were so severe that on separating them with wet sponge and fingers the hemorrhage was quite constant and considerable. Several vessels in omentum and abdominal walls were tied with silk. The abdominal walls, owing to the great size of tumor, were, after the operation, very lax and admitted of being folded over on themselves afterward; peritoneal surfaces sutured with deep sutures to control hemorrhage, and which had a good effect. These sutures were removed after forty-eight hours; sponge lost in cavity; found after prolonged search; drainage. Recovery.

CASE XXXIV.—Mrs. E. C., father died of heart disease, otherwise family history good. Patient had scarlet fever when child; leaving her with some kidney trouble. Menstruated twelve; first child born nine years previous to operation; delivered of five children; last she thinks at eighth month, living only one week. Since birth third child noticed irregularity in menstrual flow—more frequent and profuse. Lessened, however, two or three months prior to operation. September, '89, patient tapped for supposed ascites; four gallons removed. January, '90, again tapped; quart fluid obtained. Pregnant at time with last child. End February, '90, tapped again—amount fluid only few quarts. Fourth and last tapping August, '90, three gallons fluid. Child born between third and fourth tapping (March, '90). Punctures for tapping, one, two, four in linea alba, three almost in right hypochondrium. August, '90, patient noticed enlargement in right inguinal region, but noticed distension early as birth of third child; disappearing for a time, then re-appearing. Treated at time for ovaritis and enlargement of uterus—temporary relief. Enlargement in left side, but different from other. Leucorrhœa since birth first child. Abdominal section September 22, '90. Multilocular ovarian cyst, right side, left side, parovarian cyst; no adhesions; patient troubled with catarrhal inflammation intestines, which kept up diarrhœa for some time. Course recovery uneventful and otherwise uninterrupted.

CASES XXXV and LIX constitute the same patient.—Miss L. McC., æt twenty-three; menstruation painful, vomiting at times. Injured, and treated long time for spinal trouble, also retroverted uterus. Slipped on ice and afterward vomited for four weeks. Alexander operation for relief of retroversion, March, '89, by Dr. Pilcher, of Brooklyn. Menstruation more painful after operation. Entered Albany hospital April, '90; uterus carefully curetted, after rapid dilatation; no improvement. Cœliotomy October 7, '90. Right ovary enlarged, size turkey's egg, tube much thickened, both removed. Left ovary and tube apparently healthy; not disturbed. Recovery uneventful; discharged November 3, '90. No permanent relief from operation. Various kinds of treatment tried without benefit. Second cœliotomy November 9, '91. Left ovary, size small orange, undergoing cystic degeneration, tube enlarged; both removed. Good recovery; patient in excellent health September 1, '94.

CASE XXXVI.—Miss M. G., mother died of pneumonia, otherwise family history good. Health never good; menstruated at thirteen; first day of flow always accompanied by dysmenorrhœa,—lasting five days,—fluid dark and liquid. About four years ago patient noticed enlargement in abdomen, does not remember where it began. Gradually increased until tumor began to interfere with respiration, when, fluid being suspected, patient tapped February, '80. Ten quarts removed, but necessary to tap again in August, '89, four quarts being obtained this time. Both punctures low down and in linea alba. Never any pain about location of punctures. Since last tapping abdomen enlarged until about as large as first tapping. Operation October 10, '90. One large, and several small cysts removed, some very slight adhesions broken. Left ovary healthy—not removed. Recovery uninterrupted. Apposition at lower angle not perfect—silk-worm gut—exuberant granulations.

CASE XXXVII.—Mrs. E. W., family history good; personal good until two years previous to operation; menstruated at thirteen; married eight years; has two children; two miscarriages; oldest child five and youngest two years old; first miscarriage April, '88; second, September, '88. Cause of first, fall; second, indefinite; both supposed to have been advanced to third month. Summer of '89 patient had pain over site of right ovary, which grew steadily worse until in November, she was forced to her bed for some time. Blisters and hot applications had no effect. During winter had attacks of unconsciousness. Operation, October 21, '90, revealed enlargement of tube and ovary on right side, due to chronic inflammation. Left ovary could not be found, apparently thoroughly atrophied and covered by firm adhesions. Right ovary and tube removed in usual manner after tearing away numerous adhesions. Glass drainage, packed with iodoform gauze. Drainage very bloody for some time—gradually cleared. Glass tube removed October 24. Rubber tube substituted; removed 27th. Further course uneventful. Discharged the sixteenth day.

CASE XXXVIII.—Mrs. S. K., four years previous to operation had severe brownish-looking, offensive discharge from vagina. Steady pain in ovarian and across lumbar regions. Husband admitted having had specific urethritis. Diagnosis, pyosalpinx. Cœliotomy, October 30, '90. Bi-lateral pyosalpinx, double parovarian cyst and small fibroid, size English walnut, on fundus uterus. Uterine appendages removed, then fibroid. Latter, carefully dissected from fundus, but bleeding very severe, controlled by use of thermo cautery. Glass drainage; discharge free for forty-eight hours; rubber tube substituted and kept in for five days. Recovery uneventful; discharged eighteenth day. Eight weeks after operation small abscess formed in sinus left by drainage tube, through which escaped one of the silk ligatures.

CASE XXXIX.—Mrs. F. M., menstruated at thirteen—had severe fall at same time; sick two weeks from this—perfectly helpless; two years after ill again in same way—did not leave room for three years. Ever since menstruating pain in back—much increased during first two or three days of monthly periods. Married ten years; one child; no miscarriages. Diagnosis of ovarian trouble made. Oöphorectomy November 29, '90; left ovary cirrhotic, right in condition fibro-cystic degeneration; both removed. Day following operation severe pain over spine of right scapula—darting down

back of arm even to tips of fingers; joints tender for some time; this lasted for three days, recurring at intervals afterwards in spite of counter-irritants and galvanism; third day usual attempt was made to move bowels with enema without success; was continued during the whole week, sulphate of magnesia and one-sixth grain calomel administered, without any result until seventh day when small movement. December 9, bowels moving daily. Cystitis with frequent desire to urinate was an annoying complication; her symptoms finally improved, she leaving the hospital January 5, 91; patient from letters received later made a slow but good recovery.

CASE XLI.—Miss E. K., aet thirty-three. Abdominal trouble at eleven, diagnosed as dropsical, which disappeared under treatment; multiple abscesses about left leg; Dr. A. March operated removing necrosed portions bone; later old cicatrices opened up partially. March, '90, felt sharp, sudden pain in each groin, after lifting heavy washing; enlargement on both sides, corresponding to double femoral hernia, followed, abdomen now enlarged. Operation advised, but advice not followed, patient enlarging rapidly in meantime. I advised operation December 1890. Cœliotomy January 3, 1891; cyst of right ovary had ruptured. Multilocular cyst, left ovary, with uterine appendages, removed; both cysts contained viscid, glairy mass, some remaining and being agglutinated to intestine; thorough irrigation; drainage — removed third day; severe diarrhœa controlled; tenth day lower angle wound opened, discharging four to five ounces fetid pus, after which patient made good recovery, discharged April 29, fistula almost healed.

CASE XLII.—Miss M. G., family history good with exception of one uncle dying of phthisis. Personal health good up to '89, when patient had attack anæmia; recovered wholly from this. Menstruation twelve, painful but regular. Noticed hard enlargement abdomen in '90; growth slow at first, but during two months previous to operation rapid. Diagnosis tubercular peritonitis. Cœliotomy January 14, '91. Profuse discharge fluid; peritoneum studded with tubercles; left ovary enlarged, cystic and studded with tubercles — removed; glass drainage, removed thirteenth day, rubber substituted; discharge gradually lessened, at end of second week; drainage tube forced out, could not be re-inserted; gauze packing for ten days; discharged forty-second day, recovery complete — no ascites.

CASE XLIII.—Miss J. S., aet nineteen, family and personal history good. Tumor developed fifteen months previous to entering Albany hospital, February 27, '91. Diagnosis unilocular ovarian cyst. Cœliotomy February 28, '91, eleven A. M. Unilocular cyst from left ovary found, two gallons clear-looking fluid removed, and pedicle secured with Staffordshire knot; cyst, size of ordinary walnut, surface of right ovary; opened and curretted; edges of this incision sutured with iron-dyed silk; ovary and tube returned to pelvic cavity. Saw patient at one P. M., when all seemed to be going well; was called out of town, not returning until 7:30 P. M., when on visiting patient with house physician, internal hemorrhage was evidently going on. Pulse one hundred and forty-two, and sighing respiration; wound immediately re-opened, pelvis and abdominal cavity found filled with clotted blood; vessels had slipped from ligature, or knot loosened, evidently within an hour previous, from record of nurse. Pedicle re-ligated; no hemorrhage from incision in right ovary; two pints saline solution poured into peritoneal cavity, wound closed and drainage

introduced. Everything possible to bring on reaction was done; patient rallied slightly at first, and it seemed possible for her to re-act, but her mental condition was seriously shocked; she was alarmed, gradually sank and died March 1, at 8:10 P. M.

CASE XLIV.—Mrs. A. E., family and personal history good. Rapid enlargement right side near spine of ilium from December, '90; solid growth left side. Coeliotomy March 3, '91. Papillomatous cyst from left ovary; three gallons of fluid, some adhesions; another cyst connected with right ovary, closely adherent to surrounding tissues; this tapped and emptied of a viscid fluid—dirty, brownish color; in bottom of this cyst was another papillomatous growth; adhesions such it was impossible to remove this entire, cyst walls stitched to abdominal wound, and rubber drainage introduced; left side, pelvic cavity, glass drainage tube placed; patient recovered quickly and discharged May 18, '91; slight sinus of cyst right side, still existed. Re-admitted June 3, '91, with partial obstruction of bowels. Yielded to calomel, salines and enemas; sinus closed, but showed disposition to open and mass could be felt connected with right side of pelvis; improved slowly and finally discharged August 12, '91, having gained in flesh and strength. In good health until January, '93, when there was a return of intestinal obstruction, and patient re-admitted to hospital. Great distension of abdomen; lower portion old cicatrix incised; immediate presentation old, papillomatous mass filling right side pelvis. In attempting to enucleate mass, small intestine was opened into; gauze packing introduced, supposing that patient could scarcely recover, but by continuous irrigation a great amount of detritis washed out, finally fecal fistula closed, patient had normal movements, gained in health and returned to her work, but during latter part of winter of '94, growth had increased, and in May she suffered from a fistulous opening connected with sarcomatous mass, giving off an offensive discharge. Not heard from since.

CASE XLV.—Mrs. N. A., family history tubercular maternal side, good otherwise, personal history anæmia, but fairly well nourished. Two children, youngest five; no miscarriages. After birth last child, pain developed right side over ovary. 1890, first noticed growth in right side, which gradually increased; menstrual flow normal and regular until five months previous to operation, then more profuse, and dull pain followed advent, in right side; feeling of numbness in right leg since birth last child. Operation March 18, '91. Removal both ovaries, left adherent. Tumor felt right side proved to be an ectopic pregnancy. Bowels moved third day, stitches removed eighth; on twelfth patient sat up for one hour and walked about ten feet; made splendid recovery and discharged on seventh day. Later patient had her menstrual period for over a year. I then curetted cavity uterus thoroughly. Since which time she has remained well.

CASE XLVI.—Mrs. M. S., coeliotomy April 23, '91. Multilocular ovarian cyst, left side; right ovary undisturbed; there were some adhesions; glass drainage for five days, then rubber—after removal discharge, at times pus, continued for six months when ligature came away and patient made a good recovery.

CASE XLVII.—Mrs. E. C., father died of phthisis at thirty-four; mother living at fifty-six, and has had cerebral hemorrhage. Menstruated at fourteen; ceased for year, regular since; one child, aet six; no miscarriages. Since birth

of child menstruation very painful; peritonitis after birth of child, again in '83, brought on by lifting; typhoid fever at seventeen; pneumonia at twenty; in '89 had cough and slight hemorrhage from lungs. Occipital headache; appetite poor; urine normal. Cœliotomy, May 4, '91. Oöphorectomy; both ovaries cirrhotic—left cystic—bound down by firm adhesions; tube packed every ten minutes with gauze for three hours; removed May 5, much pain until tube removed; no noticeable improvement until eighth day, when enema given was followed by very free movement of gas and feces. Recovery uninterrupted except for obstinate cystitis, present still when discharged on thirty-fifth day.

CASE XLVIII.—Mrs. A. McC., family history good. Menstruated at twelve, painful; fifteen years previous to operation trouble began, accompanied by spasms. Second child born, '83, two years later diagnosis of uterine misplacement made and she received treatment. Pain in right ovary for ten years, along spine painful points, occasional points pain along angle ribs, sternum on left at juncture true and false ribs. All treatment failed and cœliotomy done May 22, '91. Both ovaries diseased; right markedly cirrhotic; salpingitis. Improved rapidly and discharged twelfth day. Re-admitted to hospital September 24, '91, very hypochondriacal—no special treatment and patient left much improved, October 12, '91. March '92 much improved mentally and physically.

CASE XLIX.—Mrs. E. C., aet thirty-three, family history good. Suffered from dysmenorrhœa; at twenty had peritonitis; married at twenty-one; first child one year after; labor very difficult; dysmenorrhœa ceased after that; since birth of child has had dull aching pain, both sides ovarian regions. Treated fall of 1890 for stricture of rectum and lacerated cervix; no improvement; mass size large orange left side of pelvis. Diagnosis of salpingitis, operation advised. Cœliotomy May 27, 1891. Both ovaries enlarged, cystic, double pyosalpinx; appendages removed; many firm adhesions; glass drainage tube—rubber substituted third day, serous discharge still quite free; drainage removed seventh day; some pain over abdomen, otherwise recovery uninterrupted. Discharged on twenty-first day; in perfect condition of health September, '94; gained in flesh and strength; able to get about with absolute comfort.

CASE LI.—Miss L. M., invalid many years, vague trouble. Physician supposed it chronic case hysteria, but first examination revealed enlarged, inflamed ovary right side; extremely irritable descending colon; well marked myelitis lumbar region; extremely anæmic, errotic, sleepless, plaster jacket applied for artificial support, later Paquelin in cautery, down spine, excellent line of treatment tried with only temporary relief; menstruation irregular, scanty, painful. Diagnosis cirrhotic ovary double salpingitis. Oöphorectomy July 13, '91. Diagnosis confirmed, also pyosalpinx left side. Patient did nicely with exception of nausea for few days; stitches removed fifth day; recovery uneventful and discharged August 15, '91. Letters from Dr. Church and patient later report good result.

CASE LII.—Mrs. A. E. B., family history good. Well during childhood; menstruated thirteen; delicate until twenty; one miscarriage. Periods not painful, but flow profuse. Well until eight weeks previous to operation. May, '91, noticed enlargement abdomen, supposed due to gain in flesh.

October, '90 to June, '91, flowed constantly, but small in quantity. No show since June, '91. July, '91, sudden, severe pain left side abdomen; diffuse and general peritonitis developed, lasting four weeks. Cœliotomy, September 1, '91. Large ovarian cyst, left side. Both ovaries removed. Patient very weak during progress operation; hypodermics of brandy and strychnine given. Drainage-tube removed second day; bowels moved fifth day. Good recovery. Discharged nineteenth day.

CASE LIII.—Mrs. M. M., family history negative; patient generally well; menstruated at fifteen; always regular — dysmenorrhœa. In '79, had inflammation of bowels. One miscarriage first year of marriage. Six months previous to operation noticed enlargement left inguinal region; increased rapidly, distending whole abdomen. Slight dyspnœa. Cœliotomy, October 1, '91. Ovarian cyst, left side, two gallons fluid. Pedicle of sac from left broad ligament — ligated in sections and removed, also tube and ovary, that side — cyst and hydrosalpinx. Patient rallied well from operation; troubled with nausea and vomiting two or three days. Sat up eleventh day; home fourteenth day, feeling very well. In good health one year later.

CASE LIV.—Mrs. V. S., family history of paralysis; menstruated at fourteen, when she took cold; afterwards suffered from dysmenorrhœa; married at twenty-one; no children; no miscarriages. Thirteen or fourteen years previous to operation, tumor in right hypochondrium — contents evacuated, she said, through stomach. Sick nine years. Spinal trouble prevented walking for six months. Misplacement of uterus. October, '90, tumor in inguinal region — grew rapidly afterwards; in June, '91, distending whole abdomen. Menopause at fifty-two; cœliotomy, October 6, '91; short incision, large unilocular ovarian cyst, right side; six quarts fluid removed; cyst removed. Patient did nicely; bowels moved third day; discharged seventeenth day; in good health two years after operation.

(To be Continued.)

New York State Examination in Medicine.

The board of examiners, as is generally known, consists of three boards representing respectively the Medical Society of the State of New York (non sectarian), the Homoœpathic State Medical Society, and the Eclectic Medical Society of the State of New York. The first named board, of which Dr. William C. Wey, of Elmira, is president and Dr. Maurice J. Lewi, secretary, has recently submitted to the Medical Society of the State of New York a report of its work for the year 1894.

It is remarked that the following statistics, given in the report, should not be confounded with those prepared by the

regent's examination department, as their records are made up annually to conform to the general method of compilation, which is based on the opening and closing of the academic year, August 1st to July 31st.

	Examined.	Passed.	Percentage of rejections.
Number of candidates			
actually examined, -	536		
Before the non-sect'n board,	470	316	32.7
Before the Homeopathic board,	59	46	22.0
Before the eclectic board, -	7	3	57.1

The report says it was thought in 1891 that the average number of candidates who would yearly appear before the board for examination would be about 400. This estimate was based on the theory that the law admitting candidates to examinations was so stringent as to exclude all not well prepared to pass their tests. Candidates for admission must be of good moral character, as certified by two reputable practitioners of medicine; they must be graduated doctors of medicine who have attended at least three full courses of lectures at a registered medical school in three different years; and must have the preliminary education prescribed by law. The exactions, it is remarked, tend to shut out the incompetent, and in consequence the percentage of rejection must be considered in this light. The discrepancy between the estimated and the actual number of candidates is imputed to two causes. Whereas, prior to 1891, the number of physicians who settled yearly in the state was from 700 to 800 (and this can only be estimated, as no exact figures are obtainable), now there are fewer than 400. The applicants numbered 536, as above stated. The natural increase in the population might account for a corresponding increase in the number of medical men; but the main cause is the fact that our state licenses have grown to be documents of such importance that most of the States having boards of medical examiners accept them as licenses to practice without exacting added medical tests.

The selection of questions properly grouped for examination purposes, says the report, is a task to which much time has been devoted, and the board invites criticism of its work in this particular, with the hope of improving on a system which has been generally commended. The questions are originally framed by all the examiners, each chair, through its three representatives, submitting, as occasion requires, 180 questions. A total of 1,080 questions thus obtained is referred to the question committee, composed of two members of each board. By that committee the questions are carefully studied and sifted, only such being accepted as are considered fair, that is, as requiring knowledge which every practitioner of medicine should have. To the committee's editor are then referred all accepted questions, and he in turn groups them in sets of fifteen in each topic, covering as nearly as possible every sub-branch of the subject under consideration. On requisition of the regents, these groups are forwarded to Albany and the regents become responsible for printing and for the language used in framing the questions for publication. Thus far, twenty-one regular and three special examinations have been held, at which 2,500 questions have been asked, or 360 questions in each topic. A duplicate of questions thus propounded and published to the world, says the report, is not desirable, but a point has now been reached where this is becoming essential if the board is to be freed from the charge of propounding queries which belong in the special fields of medicine rather than in its general field. Other similar bodies of examiners, it is remarked, submit and publish questions which indicate a far more difficult test for the license, but the method of marking seems to the board comparatively lenient as judged by the percentage of rejections. The board feels it to be its duty not to prevent a given percentage of those applying from being licensed, in order to maintain a standard, and prefers to act favorably on the application of all, no matter how great the number, whom it believes to be competent to practice medicine.

Under the provisions of the law it is permitted to endorse, as sufficient for practice, the licenses issued by other State boards of medical examiners, provided the standards of those bodies are not lower than ours. Numerous applications from various States have been received for this indorsement, but on investigation the board has in each instance found that the standard was not sufficiently high to warrant it in approving the documents submitted. The board earnestly appeals to the society to continue the work, inaugurated by the committee on legislation in 1892, of having bi-monthly transcripts of registration made from the books of the county clerks throughout the State. In this manner only, it says, can a comprehensive record of the registration throughout the State be secured, thus furnishing the opportunity of verifying or correcting the work of the county clerks. During the year many letters have been addressed to the board, calling attention to persons who are practicing medicine in various parts of the State without legal authority. It has been the boards custom to investigate all such cases and to advise prosecution where the offender is a new-comer; but when the case is one which has existed before September 1, 1891 — i. e., before the passage of the law under which the board was called into existence — it has advised against interference. The report goes on to say that the unfortunate dropping of the word misdemeanor from its former place in the work of codifying the medical laws, as reported to the Legislature by the revision committee two years ago, has robbed the statute of much of its worth. Through the energetic efforts of the societies, committee on legislation both branches of the Legislature last year unanimously passed a bill correcting this defect, but, notwithstanding heroic efforts on the part of the profession throughout the State, the man who was then Governor vetoed the bill. In order to maintain the dignity of the licensing power now intrusted to its care, the board earnestly urges that the committee on legislation be instructed to introduce this measure anew before the legislature, in the hope of restoring the statute to its integrity.

Since the society's last meeting two adjoining States have established state boards of medical examiners, the laws appointing them being modeled after our own.

The report further says: "The preliminary education of medical students and candidates for the licensing degree in this state is not satisfactory. While the standard is far above that established in other states, it is still insufficient and not on a par with the requirements exacted from students in other professions in our state. The following was unanimously carried at a meeting of our board, with the intention that it be embodied in our report to your honorable body.

"Resolved, That in the opinion of this board the best interests of the public and of the medical profession would be materially advanced by gradually increasing the minimum requirements as to general preliminary education till no candidate is entitled to matriculate in 1897 at a degree-granting medical school in this state who has not completed at least a full high-school course." — *The New Medical Journal*.

Announcement of the Twenty-second Annual Re-union of the Association of the Alumni of the Albany Medical College.

The Association of the Alumni of the Albany Medical College will hold its Twenty-second Annual Re-union on Tuesday, April 16. The order of exercises for the day will be as follows:

9 A. M.—Reception in library. Coffee and sandwiches served.

10:30 A. M.—Annual meeting in Alumni Hall. Programme: 1. Faculty address of welcome, by Prof. Bigelow, M. D.; 2. Minutes; 3. Reports; 4. President's Address; 5. Report of historians and class historians of '55, '65, '75 and '85; 6. Election; 7. Miscellaneous business; 8. Reading of letters, etc.; 9. Impromptu speeches.

12 M.—Lecture by Dr. Theobald Smith ('83) of the Bureau of Animal Industry, Washington, D. C., on "Serum Therapy, with special reference to diphtheria."

3 P. M.—Commencement exercises at Harmanus Bleecker Hall. Address by Rev. Wm. Foot Whitaker, Albany.

8:30 P. M.—Annual Banquet at Odd Fellow's Hall.

You are cordially urged to be present. Please notify the corresponding secretary of your intention and inclose your photograph, for Alumni collection, unless previously furnished. Adam T. Van Vranken ('73), M. D., *President*.

Charles M. Culver, M. D. ('81), *Cor. Secretary*,
36 Eagle street, Albany, N. Y.

Sewer Air and Diphtheria.—A correspondent of the *Lancet* writes that a year or two ago a new system of main sewerage with the ordinary road-level ventilators was inaugurated in one of the suburbs of London, and upon its being brought into use serious cases of diphtheria almost immediately began to break out. The medical officer of health at once had the drains flushed with a strong solution of perchloride of mercury, and the cases stopped almost as quickly as they commenced. — *Medical Record*.

Hygiene of Paris in 1894.—The movement of the population of a city of 2,500,000 inhabitants constitutes a source found with practical teachings of hygiene, says *L'Union Medicale*. Pathogenic influences are felt there so keenly and translated in such exact proportions that they are amplified, so to speak, as by a projecting instrument. When the temperature is lowered suddenly the number of pneumonias is correspondingly elevated; when from any cause it is necessary to turn the Seine water into the city pipes, the typhoid curve is elevated and remains so during the time of this exceptional distribution; when a small epidemic of variola develops, the number of vaccinations is multiplied, and soon the disease falls below the normal. Differences of detail, errors in diagnosis, all causes of error fade away

before the authoritative evidence of large numbers. The year just ended is particularly interesting and the weekly bulletins of the municipality furnish the necessary figures. The first thing that strikes one is the notable diminution in the general mortality. It is more than a tenth lower than the mean of the three proceeding years. And what is still more remarkable this diminution is not found in the communicable diseases. Typhoid fever, variola and phthisis, on the contrary, present a rather marked elevation. The first two, in fact, assumed somewhat in the nature of an epidemic at the beginning of the year. Diphtheria alone fell below the mean. The following table shows these differences more clearly.

	Typhoid				Total
Year.	Fever.	Variola.	Diphtheria.	Tuberculosis.	Mortality.
1891—	476	39	1,361	11,895	52,558
1892—	799	42	1,557	12,153	57,137
1893—	649	302	1,465	12,267	52,955
1894—	758	183	1,149	12,288	49,079

The constant augmentation of the number of deaths due to disease is also worthy of note. It is in accord with the progressive increase of the population. The Minotaur exacts each year its proportional tribute of young lives without being influenced by anything. — *The Journal*.

A Fight for a Tooth.—A peculiar case occurred lately in Gera, and has not yet been definitely decided. A gentleman who had suffered for some time from toothache consulted a dentist, and on his advice consented to have the offending molar extracted. This was skilfully affected, not without some trouble, for the tooth proved to be a perfect monster in size, with roots measuring as much as two centimeters. The dentist was naturally desirous of preserving such a trophy, and, although the patient claimed the tooth as his property, refused to part with it. An action was accordingly commenced on the charge of defraudation, the defendant claiming he acted by the right of a time honored custom, and that the tooth on being removed was a *res nullius*, and belonged to the first who took possession. I am afraid this will prove quite a difficult quibble to settle.—*Berlin Correspondent Occidental Medical Times*.

THE Albany Medical Annals

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HOWARD VAN RENSSELAER, PH. B., M. D., EDITOR.

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ANNOTATIONS.

Actual Experience in Filtration.—We take from a recent report of a joint commission designated by various civic and scientific organizations in Allegheny County, Pa., an interesting description of the performance of sand filters at Poughkeepsie, N. Y. These were built upon the European model in 1865, and have been in use over twenty years. They furnish 3,000,000 gallons per day. Since 1876 the beds have been used continually except during the winter of 1891, when the cold weather interfered. This difficulty has now been overcome, and they can be operated at all seasons. All the city supply is filtered, and the inhabitants have become very exacting, insisting on the continuous use of the filters. For brief periods of the year a peculiar turbidity appears which the filter does not remove. The lower courses of broken stone and gravel have never been disturbed since the filter was built, and the sand has also been in continuous use, having been several times removed, washed, and replaced. Chemic and bacteriologic analysis are always satisfactory. In November, 1891, Drown found 1161 points of microbe life in 1c. c. of the applied water and 62 points in the effluent, a reduction of 95 per cent. In 1892 the reduction was 82 per cent.—*Medical News.*

The Significance of the Venous Pulse.—The Edinburgh Medical Journal for June publishes a report of a paper read before the Medico-chirurgical Society of Edinburgh by Dr. James Mackenzie. The author divides the venous pulse into two forms, the auricular and the ventricular. The former, he says, presents distinct evidences of the functional activity of the right auricle. In this form there is also a wave due to the ventricle, and as it increases the auricular wave decreases and finally disappears, and thus the ventricular venous pulse is developed. The latter form is a more advanced stage than the auricular, and, as during its development there is a gradual fading of the auricular wave, there is a period when such terms do not sufficiently denote the character of the pulse; but the terms are convenient for descriptive purposes. The ventricular venous pulse appears only when there is organic disease of the heart itself (most commonly in valvular disease). When failure of the heart is functional and not due to organic disease of the valves, the auricular pulse persists to the end. Similar types of pulse may be recognized in the liver. Here the pulse appears only when there is organic disease of the heart.

In many respects, says Dr. Mackenzie, more information regarding the cavities of the heart can be obtained from the study of the venous pulse than from that of the arterial pulse. Thus, during a cardiac revolution the arterial pulse is in free communication with but one chamber, the left ventricle, only a portion of the time, whereas in the venous pulse the effects of the right auricle during its systole and its diastole may be observed, while the time of the appearance of the ventricular wave gives information regarding the degree of incompetence of the tricuspid orifice. Information may be gathered regarding the exact time of closure of the pulmonary valves, and the persistence of the ventricle in systole for a short time after the outflow through the arterial orifices has ceased may be noticed. There is also distinct evidence of the diastole of the right ventricle in the venous pulse. In heart failure the venous pulse affords information of a kind entirely different from that

supplied by other means. Its appearance, increase, decrease, and disappearance may give evidences of changes in the blood pressure quite inappreciable by any signs given by the arterial pulse. While, as a general rule, an increase of the venous pressure implies a diminution of the arterial pressure, that, nevertheless, is not always the case. Although in some cases the disappearance of the venous pulse is a sign of the restoration of the body to a healthier condition, yet in other cases it may precede a fatal termination. In these last cases there is also a failure of arterial pressure. In pulse irregularities no true knowledge of the action of the different chambers of the heart can be obtained except by the study of the venous pulse, and this study, says the author, throws a new light upon the heart's movements, and reveals a variety of them hitherto unexpected.—*New York Medical Journal*.

On the Disinfecting Power of Solar Rays.—Certain articles, as furs, leather, etc., cannot be disinfected by steam, since they are thereby rendered useless. Others, which are certainly amendable to such treatment, as fixed upholstered articles of furniture, cannot be removed for the purpose. To disinfect these we have recourse to gaseous agents, and they, according to the results of experiment, are not always reliable. An exception, possibly lies in formalin, which has recently been recommended by Lehman (*Munchener Medical Wochenschrift*, 1893, No. 22). Another means of disinfecting such articles consists in the use of solutions of carbolic acid or corrosive sublimate. In the case of wooden and metallic articles, with smooth hard surfaces we can rely on the result, if they are first thoroughly sprayed with the liquids and subsequently washed; but such is not the case with thick woolen materials. Duclaux (*Review Scientifique*, 1881) found that some bacteria are destroyed by sunlight, and he refers to this as an important agent in the sterilization of the atmosphere. Arloing (*Compt. Rend.*, 1885) proved that anthrax bacilli are destroyed by the solar rays. Koch has also shown that tubercle bacilli cannot be exposed to the same for very long and survive. Fermi and Celli (*Centralblatt f. Bacteriologie*) in

a series of experiments, demonstrated that germs in aqueous suspension are likewise killed, and Baspe (*Dissertation Schwerin*) asserts that the sun is able to hinder the development and even destroy bacilli lying on the surface of the soil or submerged in water. But no experiments have been hitherto made to determine how far these rays may be used as disinfectant of clothes, bed linen and furniture.

It is common custom the clothes, bed linen and mattresses in the air and sun, especially after death, possibly in the hope that currents of air may diffuse evil odors more quickly. Nevertheless, it seemed of importance to the author to investigate how far such results were trustworthy, and how far they were attributable to the direct effects of the solar rays.

Esmarch used pillows, varying the contents, skin, etc., and bacteria, as pure cultures, or pus containing micrococci. He imitated the natural conditions as far as possible. The materials were contaminated with the solutions and placed in the sun, either at once or after drying. Control experiments were made. He arranged wool, cloth, etc., in layers, and in the first series of experiments to prevent the falling of atmospheric microbes during the exposure, he placed the pieces in a box covered with a glass pane, and provided at the sides with openings for ventilation. The temperature of the interior, however, rose much higher than that of the air (30°) and vitiated the results. In subsequent experiments the objects were always placed on the grass in the sun. Esmarch concludes that the sun's rays have a marked action on the surface, but that this speedily becomes lost when bacteria are protected by layers of material. The cholera bacillus, even in the deepest layers, were killed; but this is not surprising since dessication, lasting but a short time, is fatal to it. An exposure, lasting eight to ten hours, yielded but unsatisfactory results. After one day the diphtheria bacillus was killed in the interior of the pillows, but when protected by the woolly hair of a sheep's skin, 39 hours were insufficient. Streptococci within the pillows, and the skins withstood a five days' exposure. Esmarch then sprayed

infected articles with two per cent. and five per cent. solutions of carbolic, and found that the weaker acid is little better than the sun, and that five per cent. is not altogether reliable. (Ueber sonnen desinfection E. Von Esmarch, *Zeitschrift f. Rygiene*).—*Public Health*.

A Bureau of Autopsy.—In the year 1881 there was founded at Milan a unique and curious institution, which has been at work ever since. This was the Loria Bureau of Autopsy. It was founded, and placed under the direction of Professor A. Verga, for the use of the inhabitants of Milan. That is to say, either courts of law or the family of a deceased person can have a complete examination and report in cases where a death has occurred under suspicious or strange circumstances. All autopsies are recorded, and may be consulted for purpose of study. The Bureau is intended to serve two purposes,—the advancement of knowledge, and to remove one objection to cremation raised on the grounds that crime may be less easy of detection when the deceased is effectually placed beyond the reach of examination.—*Medical Record*.

Rest for Physicians.—The physician needs more mental diversion. He needs more active exercise; and more sleep, too—fully seven hours—and as his sleep is often broken in upon at night, he should form the habit of sleeping as odd moments, even by day. The folly of incessant work is illustrated by the case of the brilliant Dr. Golding Bird, of London, who, a few moments before his death, remarked to a medical friend, when his own great popularity was mentioned: “You see me, at a little over forty, in full practice, making my several thousand pounds per annum. But I am to-day a wreck. I have a fatal disease of the heart, result of anxiety and hard work. I cannot live many months, and my parting advice to you is this: never mind at what loss, take your annual six weeks holiday. It may delay your success, but it will insure its development. Otherwise you may find yourself at my age a prosperous practitioner, but a dying old man.”—*Medical Summary*.

A New Method of Making Palatable and Digestible Milk. — Dr. Robert T. Edes, of Boston, gives a valuable way of preparing milk where other methods have not proved useful.

A pint of milk is gently warmed. Into it is dropped, very slowly and with constant stirring, about twenty minims of the dilute hydrochloric acid of the United States Pharmacopoeia. The milk should be stirred until it cools. In this way a very fine flocculent coagulum is produced, floating in the whey, which is easily accessible to the digestive secretions, while the whole fluid has lost somewhat of the flat and cloying taste which makes it unacceptable to so many. It will be noticed that milk prepared in this way differs from the various "wheys" in the highly important particular that the casein is retained and used, instead of being separated out as a distinct product, while it avoids the bitterness of pancreatinized milk. — *Boston Med. and Surg. Journal*.

Venereal Diseases in the English Navy.—Judging by the report of the Director-general of the Medical Department of the English Navy for the past year, venereal disease is playing sad havoc in the service. There occurred during the year no less than 9,321 cases of syphilis and gonorrhœa; 3,106 of primary syphilis, 1,593 of secondary syphilis and 4,622 of gonorrhœa and its sequelæ. The number invalided for these diseases was 198, and there were five deaths. 4,923 of the cases came under observation at the home station. The ratio of primary syphilitic patients amounted to 51.66 per 1,000, as compared with 74.28 in the previous year. The time that the venereal patients were incapacitated from duty amounted in the aggregate to no less than 282,171 working-days. Apart from its moral aspect, the subject is one demanding the most profound consideration. With the figures given before us, it is difficult to understand why less attention should be directed to the prevention of venereal diseases than is given to that of transmissible diseases.—*Medical News*.

Report of a Case of Extreme Hyperpyrexia.—(*Pittsburg Medical Review*, October, 1894). By James H. Murdoch, M. D.

The woman, aged twenty, was being treated for retention of urine by gradual dilation of the urethra on every second day. Her temperature remained about normal for nearly a month after admission to the hospital. The evening temperature was then recorded as 101.5°F., and at 3 A. M. was 112°, with respirations 52 and pulse 132. A sponge-bath and tincture of aconite, gtt. i, reduced the temperature in fifteen minutes to 98.6°, but at 10 A. M. it had risen to 114°; under the treatment it fell in an hour to 102°. At 12.30 P. M. it had again risen to 114.8°, but after profuse perspiration it fell to 99.6°. At 1.45 P. M. it was 119°, and at 2.30 P. M. it was 120°. These variations continued for four days, when the temperature reached the normal point and remained so. There were no outward signs of fever. The hysterical stigmata were not pronounced, and yet the high temperature was believed to be hysterical.

Diminishing Birth-Rates.—During recent years the birth-rate per thousand population has been diminishing in proportion to population in most civilized countries, as will be seen by the following table:

COUNTRY.	1880.	1890.
United States - - -	36.0	30.7
England and Wales -	34.2	30.2
Scotland - - - - -	33.6	30.3
Ireland - - - - -	24.7	22.3
France - - - - -	24.5	21.8
Belgium - - - - -	31.1	28.7
German Empire - - -	37.6	34.7
Austria - - - - -	38.0	36.7
Switzerland - - - -	29.6	26.6
Denmark - - - - -	31.8	30.6
Norway - - - - -	30.7	30.0
Netherlands - - - -	35.5	32.9

— *Medical Record*.

A Natural Result.—The wedding of Dr. F. Byron Robinson to Dr. Lucy W. Waite, both of Chicago, is announced. Coupled with the announcement is the statement that Dr. Waite retains her name, and therefore her “identity.” This is in keeping with what we have often had occasion to remark: it is one of the natural results of the so-called advance movement of woman; a movement which they claim is to restore their rights after years of servitude.—*Food.*

REVIEWS AND BOOK NOTICES.

Annual of the Universal Medical Sciences.—A Yearly Report of the General Sanitary Sciences Throughout the World. Edited by Charles E. Sajous, M. D., and seventy Associate Editors, assisted by over 200 correspondents, editors, collaborators and correspondents. Illustrated with chromo-lithographs, engravings and maps, F. A. Davis Company, Publishers.

The *Annual* of the Universal Medical Sciences for 1894 does not differ in any essential particular from the preceding issues of this valuable work.

Its efficiency and worth increases with each succeeding year; partly by reason of the fact that its numerous staff of editors become better trained by long experience, and partly because they are continually obtaining a clearer understanding of the needs of the medical profession on both continents.

The present issue of five volumes contains an epitome of everything of value that has recently appeared in medical literature in every language; and presents in a condensed form, with exact reference to the medical journal in which the article has appeared, the most advanced thought and progress in each branch of medical science during the preceding year.

The progressive physician who wishes to keep abreast of the times, can best accomplish his purpose by a yearly perusal of this valuable work, which stands at the head of the various reviews of current literature which are printed in the English language.

Practical Urinalysis and Urinary Diagnosis.—A Manual for the Use of Physicians, Surgeons and Students. By Charles W. Purdy, M. D., Queen's University; Fellow of the Royal College of Physicians and Surgeons, Kingston; Professor of Urology and Urinary Diagnosis at the Chicago Post-Graduate Medical School. Author of "Bright's Disease and Allied Affections of the Kidneys;" also of "Diabetes: Its Causes, Symptoms and Treatment." With numerous illustrations, including photographs, engravings and colored plates. In one crown octavo volume, 360 pages, in extra cloth, \$ 2.50 net. Philadelphia: The F. A. Davis Co., Publishers, 1914 and 1916 Cherry street.

In this work the aim of the author has been to present to the medical profession, as concisely as is consistent with clearness, everything that is known to be of practical value in the examination of urine.

He has combined in one volume both the medical and surgical aspects of the subject, which have usually been considered separately by most writers.

In dealing with each ingredient of the urine, the following order has been observed: Its chemical nature and composition; its source in the economy; the significance of its increase or decrease in the urine, with the relation of these to metabolic processes, food-supply, physical surroundings and tendency towards disease; and, finally, the most approved methods of its detection and determination.

The second division of the work: Urinary Diagnosis, aims at a concise description of the special features of the urine processes in progress in the economy, whether they be local or general, medical or surgical, together with a brief enumeration of the leading clinical symptoms of each disease, and, in most cases, an epitome of their nature and etiology.

There is also an appendix upon the subject of urinary examinations for life insurance.

In the aims which the author has undertaken, he has succeeded admirably and has produced a book which will probably long rank as a standard.

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Chronic Parenchymatous Nephritis.*

BY JOHN V. HENNESSEY, M. D.

Mr. President and Gentlemen of the Society :—

In pursuance of the excellent plan of our worthy president, I shall endeavor to present to you the subject of “Chronic Parenchymatous Nephritis.”

I understood that its pathology was to be demonstrated by Dr. Hailes, at the same time that he exhibited slides of sections from cases of interstitial nephritis. I regret that he did not do so, as the differences of opinion in regard to the disease are principally in relation to its pathology.

Chronic parenchymatous nephritis has been subdivided by some authors into two or more varieties, as the inflammatory process attacks the epithelium lining the tubules, the malpighian tufts, or the blood vessels. Though these varieties may be found separately on microscopic examination, they are more frequently found combined, and when it comes to clinical examination they can rarely be differentiated. Other authors include under this head, the waxy form of degeneration which so often follows prolonged suppuration. This is the form of disease which is usually known as the large white kidney. They are regularly increased in size, often weighing from fifteen to twenty ounces. One or both kidneys may be affected. The capsule is thin, not adherent, and the surface of the kidney is smooth. The cortex is thick and dull yellowish white, while the pyramids are full of distended blood vessels and are dark red.

The epithelium lining the tubules and of the malpighian capules is swollen, granular, or detached. The tubules are filled with detritus oil globules and casts.

There may be an increase in the number of small cells which cover the tufts of vessels in the malpighian bodies.

It is stated by most writers that it is a disease of middle life, that most cases occur between the ages of thirty-five and forty-five years. While this is probably true, I must say that in my experience it has been much more common in later life; the greater number that I have seen being in persons from fifty-five to seventy-five years of age.

Heredity apparently plays a part,—not that the disease is inherited, but probably a type of kidney structure particularly prone to disease is, for certain families seem to have an undue proportion of cases of nephritis. It may follow an attack of acute nephritis, or more properly, I presume an attack of acute nephritis that ends in neither death nor recovery in the ordinary time is a case of chronic nephritis. It may follow chronic congestion of the kidneys. Although all the causes are not thoroughly understood, some of the known ones are:

Depressing conditions acting on the general health for a long time; probably it is in this way that prolonged mental anxiety acts, for it has been claimed as a strong etiological factor.

Chronic malarial poisoning, chronic alcoholism and chronic poisoning by metals though more likely to induce interstitial nephritis, may still cause this form.

Whether organic heart disease is or is not a cause, it is certainly very often coincident.

As the cause of acute nephritis is most often the circulation of a virulent poison through the kidneys, as of scarlet fever, or diphtheria, so it may be that a systemic poison of lesser virulence acting for longer periods of time may cause this form. In this way the above mentioned causes would act as primary ones.

The subjective symptoms are so numerous and often so inconclusive, that I believe that most careful practitioners,

when unable to find a cause for a disturbed condition of health, suspect the kidneys to be the offending organs, and an examination of the urine often proves the suspicion to be correct. The onset of the disease is generally insidious,—perhaps being months in existence before the patient begins to complain, and then, generally, he does not speak of his kidneys (in sharp contrast to the innumerable cases of lumbago, that come complaining of kidney disease)..

The most prominent symptoms are different in different cases, and different in the same case, as it is seen early or late in the disease.

In cases seen early, disorders of digestion are frequent,—there may be only the symptoms of atonic dyspepsia, or there may be slight or severe occasional or persistent vomiting or diarrhœa or both.

Dyspnœa on exertion is a very common early symptom, the patient usually believing he has lung or heart disease. This is usually due to the condition of anæmia, which is always present and often in a marked degree. It may also be due to dropsy or it may be a purely nervous phenomenon.

Headache often very severe and usually frontal. It is very obstinate and is not relieved by the ordinary headache remedies.

Disturbances of vision are sometimes among the earliest symptoms complained of, but are often found later in connection with early uremic symptoms.

A general feeling of lassitude and disinclination to exertion are the only things complained of in some cases. I remember one case in which the only symptom was a dry scaly skin.

Cough, and sometimes an obstinate attack of asthma which resists treatment may be the first symptom to attract attention, though this is much more common, I believe, in interstitial nephritis.

Inquiry in regard to the urine reveals the fact that it is passed more frequently than formerly, and that the quantity is diminished.

On examination it is found to be of fairly high specific gravity ranging from 1022 to 1032 with a constant and fairly large amount of albumen, urea is diminished and uric acid and urates increased.

On microscopical examination there is found, cast off epithelium, some blood corpuscles and casts of the epithelial hyaline, granular, or fatty variety. The casts may be large or small, or both. I wish to state here that the symptoms enumerated above, as early ones may and do appear at any time during the disease.

So also with those which I shall call the later ones; they may be among the earliest to develop.

Dropsy is present at some time in nearly all cases. At first it may be only a slight puffiness of the lower lids on rising in the morning or slight œdema of the ankles after standing all day, or it may be a husky toneless voice from œdema of the laryngeal mucous membrane. It tends to increase and by degrees the legs, penis, scrotum and abdomen successively become distended.

The distension may become very great and œdema of the lungs or effusion into the thoracic or abdominal cavities take place.

Muscular twitchings of greater or less extent are apt to occur.

Somnolence, the patient easily falling asleep while sitting up, is one of the late symptoms.

Uremic convulsions, though not occurring in all cases, are frequent as a late symptom. Where dropsy is extensive they are not so apt to occur.

The symptoms which are forerunners of uremic convulsions are; persistent vomiting, headache, muscular twitchings, disturbances of vision and marked decrease in the quantity of urine.

Uremic coma usually follows convulsions, but may develop independently. Mild delirium or even well marked delusions are not uncommon late in the disease.

The course of the disease is usually slow, the more rapidly fatal cases taking weeks at least, while the others may go on for months or even years.

Cases in which there has been marked dropsy, or even in which uremic convulsions and coma have occurred, may gradually recover from most of the symptoms, albumen and casts still persisting; and may later go through the same course of illness.

The prognosis is generally regarded as very unfavorable, Personally I have had reason to believe that it is not so to the degree usually stated. Last year I presented a paper to the society on that subject with a statement of my reasons for so thinking.

Where recovery ensues, the dropsy, if present, gradually disappears, the general nutrition improves, and albumen and casts are found in lesser amount. When death occurs it may be by exhaustion from accumulation of fluid in the cellular tissue or in the cavities, or it may be in uremic coma which may or may not have supervened on uremic convulsions. Or it may be the result of some intercurrent disease, as pneumonia.

The treatment of the kidney disease is necessarily very general and simple. Avoidance of exposure to cold, sudden changes of temperature, chilling the body when there is perspiration, wetting of the feet, etc. The wearing of warm wollen underclothing, avoidance of stimulants, regulation of the bowels, and general attention to health.

Aside from this the treatment is in the main symptomatic For the dropsy, free catharsis and diaphoresis.

Diarrhœa, I have come to believe, is conservative and for this reason I believe we should be slow to check it.

For the headache, eye symptoms, muscular twitchings, and severe vomiting, I believe, free catharsis to be the best treatment, as they are usually due to the condition of uremia.

For uremic convulsions morpha hypodermically. As late in the disease there is great debility and heart weakness, digitalis in medium doses and the usual tonics have a good effect. Chronic parenchymatous nephritis is differentiated

from the waxy form by the absence of the history of prolonged suppuration. From interstitial nephritis by the following signs: In parenchymatous nephritis the urine is scanty. Its specific gravity is high. Albumen is *constant* and in fairly large amount. Casts are more numerous. Dropsy is frequent. While in interstitial nephritis the opposite is the case..

The Unity of Bright's Disease ;

BEING A DISCUSSION OF DR. HENNESSEY'S PAPER ON CHRONIC PARENCHYMATOUS NEPHRITIS, READ BEFORE THE ALBANY COUNTY MEDICAL SOCIETY FEBRUARY 27TH, 1895, BY HENRY HUN, M. D.

Our society has had presented to it two excellent papers: One on interstitial nephritis and the other on parenchymatous nephritis, and I should judge that it was the idea of our president, Doctor Ball, that all cases of chronic Bright's disease could be referred to one or the other of these two classes. He has left no place on the programmes of the meetings for the consideration of chronic diffuse nephritis, which, in my opinion is more common than either the interstitial or the parenchymatous form. This is certainly a modest classification of Dr. Ball's, when compared with the very elaborate one which is advocated by Delafield in volume one of the "Twentieth Century Practice," and yet I doubt if even this classification can be rigidly maintained. I even doubt whether the term "nephritis" is applicable to all the cases, and whether some are not of a degenerative, rather than of an inflammatory nature.

There are, undoubtedly, cases of chronic Bright's disease, which from the beginning to the end present the characteristic symptoms of interstitial nephritis and at the autopsy the pathological changes are found to consist almost entirely in an hypertrophy of the renal connective tissue, although even in these cases the parenchyma of the organ is always more or less involved. The same cannot be said of chronic parenchymatous nephritis. I saw, in consultation with Dr. Hennessey,

a man who died of interstitial nephritis as far as the urinary and other signs would indicate, and such was the diagnosis of the doctor and myself, and yet, several years previously I had seen the patient and had examined his urine on a number of occasions, extending over several years, and at all of those times the urine was of high specific gravity, contained a large amount of albumin and a large number of granular casts; in fact, the appearances which are characteristic of parenchymatous nephritis. Such cases I think are not uncommon and make probable, a gradual transformation of the parenchymatous to a more interstitial form. I think moreover, at the autopsies of cases of parenchymatous nephritis, the interstitial tissue is always involved and often to a very great degree; so much so, that this form of disease has been termed "chronic diffuse nephritis," to indicate that the inflammation attacks the interstitial tissue as well as the parenchyma.

I admit that for purposes of study, it is often desirable to make as many sub-divisions of a disease as possible, and that much information may be obtained in chronic Bright's disease by grouping the cases into classes, but I also think that we may obtain a great deal of knowledge about a disease when we consider it in its entirety, and I should like to make a plea to-night for the unity of Bright's disease.

When we consider the diseases of the kidneys and exclude from them those which depend on passive congestion, on pregnancy, on amyloid degeneration and the suppurative diseases which are secondary to disease of the bladder and ureters, there remain a number of diseased conditions which for many years have been classed under the general name of Bright's disease. All the forms of Bright's disease, however varied their pathological lesions may be, have one common etiological factor, in that they are due to a poisoned condition of the blood. In these cases the blood carries to the kidneys certain noxious substances, and the essence of Bright's disease consists in the reaction of the tissues of the kidneys to these harmful substances. The varying character of the changes produced in the kidneys depend partly on the quality

and quantity of the noxious substance, and partly, on the power of reaction which the kidneys themselves possess. When the poison acts with great intensity on the kidneys, there result the acute forms of Bright's disease, and the pathological changes are limited almost entirely to the blood vessels; the only lesions found being intense congestion and numerous hemorrhages. In other cases of acute Bright's disease, of somewhat lessened intensity, in addition to these vascular changes, lesions are found in the parenchyma, especially in the epithelial cells covering the glomeruli and the convoluted tubes, and also, some cellular infiltration of the interstitial tissue; the changes first showing themselves usually in the glomerular tufts. When the poison is less intense in its action, but is continued over a longer time, we get the various forms of chronic Bright's disease, the parenchymatous form depending, probably, on a moderate dose of the poison acting for a short time, while the interstitial form depends on a small dose of the poison, the action of which is more constant.

That this is no mere product of the imagination is shown by the experiments of Aufrecht,* who found that by ligating the ureter for a varying length of time, he could produce a pathological change either in the parenchyma alone, or in the parenchyma and the interstitial tissue at will. If the ureter was ligated for only a short time, and then the ligature removed, a change was found which was limited to the cells of the tubes. If the ligature remained on a longer time, not only the cells lining the tubes were altered, but also the interstitial tissue showed a very decided infiltration of round cells. But the most striking experiments of Aufrecht are those in which he injected subcutaneously into animals, small doses of cantharidin suspended in oil. In this way he could produce all the forms of nephritis: the acute, the parenchymatous, the diffuse parenchymatous and the contracted kidney. The contracted kidney was produced by the very frequent injections of small doses of cantharidin.

*Centralblatt für die Medicinischen Wissenschaften, 1882. Page 849.

What Aufrecht produced experimentally, I believe is very frequently seen clinically, and in cases where the poison is brought in small quantities very frequently to the kidneys, and the kidneys are in a person having much resisting power, a great increase of connective tissue takes place and the course of the disease very slow; the patient living for years. On the other hand, a larger dose of the poison or a small dose of a more intense poison acting upon a kidney with less resisting power, attacks with greater intensity the parenchyma which will degenerate, and the disease runs a more rapid course under the form of parenchymatous nephritis. But even in this more rapid form, the interstitial tissue is always more or less involved, and in place of parenchymatous nephritis, it would be better, I think, to use the term "diffuse nephritis" as is done by a great number of physicians.

We may get some light on this obscure subject, I think, if we consider a very different, and yet, somewhat analogous condition in the lungs. A few years ago cheesy pneumonia, broncho-pneumonia, apex catarrh, desquamative pneumonia, fibroid pneumonia, etc., were described as separate diseases and much ingenuity was devoted to their different diagnosis, but now we know that all these conditions, except the latter, and very many forms of broncho-pneumonia as well, are due to one and the same cause: the bacillus tuberculosis, and that the varying pathological conditions found depend in part on the number of bacilli tuberculosis which invade the lung and in still greater part on the resistance which the lung offers to the invasion of these bacilli. Before the bacilli had been discovered, and the true nature of these processes had thus been known, these different conditions seemed to be entirely independent diseases, and fibroid pneumonia was supposed to have little or no relation with the consumptive processes. Many cases of fibroid pneumonia run a course from the commencement to the end totally different from ordinary cases of consumption; quite as different as the symptoms and lesions of the contracted kidney are from those of the other forms of Bright's disease. In both of these

diseases there is a great increase of connective tissue and certainly in the case of the pulmonary affection this increase of connective tissue is curative in a measure and tends to limit the spread of the disease. It is not impossible that the increase of connective tissue in the contracted kidney serves the same purpose; the contracted kidney being without doubt the slowest in its course of all the forms of Bright's disease.

The referring of all these different pulmonary conditions to the one cause, and the studying of the varying way in which the lung tissue reacts to the invasion of the bacilli, has been most profitable, and we understand pulmonary pathology very much better now than we could have understood it by studying, no matter how minutely, the variations of these same disease as clinical and pathological entities. In an analogous way, I think that we may get quite as much knowledge about Bright's disease if we take a general view of the manner in which the tissues of the kidney react to the poisons brought to them by the blood, as if we divide Bright's disease into a great many different classes and study each class very minutely, but independently of all the other classes.

Therefore I think that it is not out of place for me in the discussion of these papers on interstitial and parenchymatous nephritis to make this plea for the "unity of Bright's disease" in a broad sense, and for the study of this disease as a whole as well as in its separate parts.

An Absurd "Pure Food" Law.—The absurdity of the legislation against oleomargarine in the interest of "pure dairy butter" was laughably demonstrated last week at the annual meeting of the Pennsylvania State Dairymen at Meadville, Pa., when prizes were offered for the best butter exhibited. Mr. A. J. Palm, editor of the Meadville Messenger, who has strenuously opposed the present State law against "imitation butter," sent to Chicago for three packages, which he exhibited as butter and gave the name of three of his dairymen friends as exhibitors. The one pound package of imitation received second premium and a third premium was awarded on the five pound package. The five pound package of imitation butter scored one point higher than the best dairy butter in the one pound package.—*The Journal*.

Report of One Hundred and Forty-Five Operations Done for Removal of Ovarian Tumors and Pathological Conditions Associated with the Ovaries and Uterine Appendages Only.

By

A. VANDER VEER, M. D.,

PROFESSOR OF DIDACTIC, ABDOMINAL AND CLINICAL SURGERY, ALBANY, N. Y.

CONTINUED FROM LAST MONTH.

An abstract of this paper was read at the meeting of the American Association of Obstetricians and Gynecologists, Toronto, Canada, September 19th, 1894.

CASE LV.—Mrs. A. R., family history negative. Patient always in good health. Menstruated at fifteen; regular; menopause at thirty-seven. Ten children; one labor tedious and painful. May, '91, first noticed enlargement abdomen, which grew rapidly, causing dyspnœa and pain. Cœliotomy October 6, '91, before class; multilocular ovarian cyst; trocar in sac and gallon grayish, fetid pus removed; pedicle ligated and cut away; removal both ovaries; peritoneal cavity flushed with hot water; drainage tube lower end wound, packed with iodoform gauze—removed second day; fourth day, in absence nurse, patient got up; same next day, with no inconvenience except increased heart's action—120. Gained gradually; homesick and discontented and allowed to leave on eleventh day. Recovery excellent.

CASE LVI.—Mrs. N. P., family history of consumption and cancer; well when young; menstruated at fourteen—regular except at seventeen when amenorrhœa three months; no children; no miscarriages; '89 doctor noticed tumor in right side; aspirated winter '91, through vagina, discharging for long time; lost flesh; appetite good, bowels regular. Cœliotomy October 8, '91; abscess in layers broad ligament; aspirated—about six ounces pus removed; great adhesions to intestines; glass drainage; nausea and vomiting for two days—improved after that rapidly; rubber tube substituted for glass few days before she went home, when she felt very well. Discharged twentieth day. Gained rapidly in flesh and strength; was well for nearly a year; then had an attack pelvic peritonitis, followed by abscess, and died, I am informed, of sepsis.

CASE LVII.—Mrs. E. J. L., mother died of consumption aet forty; indefinite history dropsy. Menstruated at fifteen—regular before marriage at twenty-

three. Since flow prolonged and lasting six days; sometimes overruns two or three weeks; once sixteen months. Feet wet eight years before operation, when flow excessive. One child, nineteen months old. Two attacks peritonitis—rheumatic troubles occasionally. First noticed tumor right side abdomen after birth child—grew rapidly following summer. Slight dyspnœa. Cœliotomy October 15, '91. Unilocular ovarian cyst; six quarts fluid removed; pedicle ligated and tumor removed with both ovaries; suffered second day from nausea and vomiting—lasting two days. Patient did well after this; stitches removed sixth day; sat up twelfth day. Regained strength very rapidly, and went home on sixteenth day.

CASE LVIII.—Miss I. R., aet nineteen; family history good. Confined to bed part of time during menstruation. Diagnosis of chronic ovaritis with salpingitis and operation advised. Cœliotomy October 19, '91; left ovary much atrophied; removed with tube; right undergoing cystic degeneration, also removed with tube; much nausea and vomiting; considerable pain in abdomen after operation, but soon recovered; had uneventful convalescence, returning home on twentieth day. Three months after began to vomit—though having gained much in flesh and strength—which continued more or less until patient finally died with all the symptoms of cancer of the stomach, one year after operation.

CASE LIX.—Miss L. L. McC., same patient operated upon October 7, '90. November 9, '91, not having improved, second cœliotomy performed; left ovary, size of hen's egg, found undergoing cystic degeneration, and removed with tube; patient much nauseated for several days, after which made an uninterrupted recovery. Discharged on twenty-ninth day. In excellent state of health August 1, '94.

CASE LX.—Miss K. E. M., father died consumption aet fifty; history otherwise good; menstruated at fourteen; regular. October, '90, noticed distension abdomen, which increased; no pain until summer '91, then some in right inguinal region. Cœliotomy November 24, '91; unilocular ovarian cyst; eight quarts yellow fluid removed; tumor from left ovary; pedicle tied; right ovary cystic and removed; dressed as usual. Patient improved rapidly without any disturbance, and discharged on fifteenth day.

CASE LXII.—Miss L. McK., cystic degeneration ovaries; pelvic peritonitis—salpingitis; removal uterine appendages—many adhesions; recovery; bowels moved fifth day; stitches removed seventh day. Discharged twentieth day.

CASE LXIII.—Mrs. M. B. M., aet thirty-three, family history negative. Since birth first child, November, '88, has had severe attacks of peritonitis, with constant pain, more or less severe; no permanent improvement under continuous treatment; I saw her with family physician, December, '91, agreeing with him as to diagnosis of pelvic peritonitis with probable pyosalpinx. Cœliotomy December 14, '91; tubes very much enlarged, distinct pyosalpinx right side, ovaries in a condition of cystic degeneration, many adhesions and a tedious operation; glass drainage tube; good recovery, and discharged thirty-second day. In good health up to October and November, '93, when she had a discharge from vagina very much like menstrual flow. Repeated once during winter '94, Dr. Pond, family physician, previously discovering cystic enlargement connected with right cornu of uterus. Aside from this patient

in excellent health. I saw her in May, '94; no return of discharge; uterus seemed atrophied somewhat, but in good position; otherwise pelvis presented a normal condition.

CASE LXIV.—Mrs. F. E. D., paternal grandmother died cancer uterus—otherwise history negative. Diseases childhood—otherwise healthy. Menstruated at twelve—regular—pain at first. Married sixteen years; first child ten months after; four born; youngest two and one-half years. September, '90, pain low down in pelvis, left side; flowed two weeks; in bed three; since severe pain continuously increasing in area; more severe during monthly periods. Cœliotomy January 2, '92; oöphorectomy; tubes enlarged, containing pus; ovaries enlarged and cystic. Drainage; oozing few days, Rallied quickly; good recovery. Discharged fifteenth day.

CASE LXV.—Mrs. D. B., phthisis on mother's side; otherwise history negative. Diseases childhood. Menstruated thirteen; regular until eighteen, when married. First child at nineteen; second at twenty-three. Since birth first child very weak; pain in back, and right inguinal region—some leucorrhœa. Cœliotomy January 26, '92. Miliary tubercles over peritoneum: right ovary removed—tubercular; drainage; wound dressed usual manner. Patient rallied nicely; continued to improve constantly; drainage tube removed seventh day; went home twenty-fifth day very much improved and stronger. Good health fall '94.

CASE LXVI.—Mrs. M. K., aet twenty-seven; personal history good; family history of phthisis; one sister had tumor of neck. From '82 to '88 noticed abdomen distended at menstrual periods, decreasing a few days afterwards; but in '88 increase more prominent on left side. January 30, '92, diagnosis ovarian tumor. Cœliotomy February 2, '92. Unilocular cyst right ovary; very broad pedicle; dermoid cyst connected with left ovary; removed. In closing incision hemorrhage presented from pedicle on right side; controlled by chain stitch, and using fine silk for stitching over and over the peritoneal surfaces. Patient re-acted well. Visited her at four p. m., and her condition led me to fear internal hemorrhage; she was restless; pulse one hundred and forty; immediately re-opened, but only about one ounce of bloody serum in cavity of pelvis; ligatures, etc., in good condition. Drainage introduced; patient recovered during night; following day seemed much better, but heart's action weak, although other conditions favorable, and she died unexpectedly February 8 at five p. m. Autopsy revealed cause of death pulmonary embolism of right lung, with clot in right heart. I believe it was a great mistake, on my part, to re-open the peritoneal cavity. It was an additional shock to the patient, and if avoided she might have recovered.

CASE LXIX.—Mrs. F. S., tubercular peritonitis. Removal of uterine appendages March 9, '92. Recovery. Discharged thirty-first day. This patient had some symptoms of a return of her disease a year later.

CASE LXX. Miss B. C., tubercular peritonitis. Cœliotomy April 8, '92. Removal uterine appendages—drainage tube packed often. Removal sutures twelfth day. Recovery. Discharged thirty-second day. After history satisfactory.

CASE LXXII.—Mrs. A. H., family history negative. Diseases childhood. Menstruated thirteen; regular, profuse. Typhoid fever ten.

January, '91, sharp abdominal pains—constipated two years—micturition normal; lost flesh. Cœliotomy May 26, '92. Large trocar introduced; removed four gallons fluid; cyst adherent several places—pedicle right ovary—adhesions ligated; drainage inserted. Patient recovered nicely. Discharged thirtieth day.

CASE LXXIII.—Mrs. L. G., aet forty-two; family history negative. July, '91, severe pain in region right ovary; repeated attacks followed with vomiting. Two years after first attack abdomen enlarged; May 27, '92, patient measuring forty-six inches around umbilicus; large quantity of sugar in urine; specific gravity 1038; however, I was induced to operate, and cœliotomy performed May 29, '92. Multilocular ovarian cyst from left ovary; glass drainage; removed second day. Until this time no unfavorable symptoms; secretion of urine abundant, specific gravity 1030, color unchanged, etc., but large quantity sugar present. Amount passed second day, twenty-four hours after operation, fifty-six ounces, when secretion suddenly ceased; patient sank into comatose state, dying night third day after operation. Truly, this was a case not suited to any operative interference and should have been left alone, or merely tapped.

CASE LXXIV.—Mrs. I. L., father died cancer stomach; otherwise history negative. Diseases childhood. Menstruated at fourteen; normal; '85, severe pain right ovary, aggravated when riding or walking; attack lasted one year; '91 abdomen enlarged; continued until operation. April, '92, raking in yard, when seized with severe pain right side; continued several days; enlarged more rapidly after this. Cœliotomy June 15, '92. Cyst wall laid bare, trocar introduced and two gallons fluid removed, tumor from left ovary adherent in several places; left ovary and tube removed; abdomen flushed with warm water; six inch drainage tube inserted, packed with iodoform gauze. Patient made excellent recovery. Discharged twenty-ninth day. In good health June, '94.

CASE LXXVI.—Mrs. L. C. B., paternal grandmother died cancer. Patient well and strong. Menstruated at fifteen; regular until menopause at fifty. Since flowed irregularly until age of sixty. Ten children; two miscarriages. March, '91, first noticed pain and growth right side, ovarian region; not definitely located one spot. Gradual enlargement abdomen, but pain and soreness left after few weeks, returning March, '92. September, '92, very little pain in abdomen; vomited some; persistent insomnia. Cœliotomy September 30, '92. Large multilocular ovarian cyst right side removed; one or two cysts emptied in peritoneal cavity. Fluid clear in color; sixteen pints; drainage tube removed in twenty-four hours; vomited fourteen hours. Good recovery. Discharged thirteenth day.

CASE LXXVII.—Mrs. H. G., aet forty, widow, family history of phthisis. Menstruation always accompanied with more or less nausea, with vomiting. Married at thirty-six. Husband dissipated; married life not happy. September, '90, had first attack pelvic peritonitis, three months after abdomen enlarged, left side, in broad ligament; another attack pelvic peritonitis six months after first, tumor gradually enlarging. December 11, '91, suffered from all symptoms suppuration. At one time patient able to get out, came to my office and I confirmed her physician's diagnosis that of double pyosalpinx,

with pelvic abscess, origin probably specific. Cœliotomy October 10, '92. Double pyosalpinx, removal uterine appendages very tedious. They were the largest and abscess cavity greatest of any specimen I have ever removed. Glass drainage; discharge on examination gave evidence gonococci present. Patient rallied well from operation, all seemed well up to end fourth day, when vomiting began, presenting evidences peritonitis with great exhaustion; died end sixth day.

CASE LXXX.—Miss E. W., aet twenty-four. Decided history of phthisis. Patient had well-marked lateral curvature with rotation. Menstruation more or less irregular, during which time abdomen enlarged for three days, and she suffered much pain. Increase more rapid after '91. Cœliotomy November 1, '92. Multilocular cyst, right ovary; broad pedicle. Some adhesions, but not firm; drainage; vomiting not well controlled. Intestinal obstruction on third day, not relieved by any line of treatment, and patient died end of fifth day. Death caused by adhesions between small intestine and stump of pedicle.

CASE LXXXI.—Miss E. W., paternal side tubercular. Patient had very severe nose bleed; bleeding stopped at age twelve when menstruation began; but patient suffered sharp pain in back. '91 noticed enlargement abdomen which increased rapidly. Attacks dyspnœa. Cœliotomy November 3, '92. Diagnosis of multilocular ovarian cyst confirmed; fluid clear and straw-colored; pedicle ligated; incision closed. Wound healed by first intention; no drainage. No complications. Patient sat up seventh day, when stitches removed. Discharged twentieth day.

CASE LXXXIV.—Mrs. E. G., family history good, with exception father who died of consumption. Patient well and strong; worked very hard. Menstruated at twelve; ceased; again regular at sixteen, until '84 when pregnant. '88 first noticed pain left side, region ovary, to pubis and knee. Trouble in passing urine. Bowels very constipated; worse at times. October, '92 movements once in eight or nine days. March, '92, very severe pain until June, then patient went to Troy, undergoing operation for "falling of womb." In bed four weeks. When lying down sensation of difficulty in breathing; vomited everything placed in stomach unless in standing or sitting position. Flowed after operation more or less. Upon movement patient felt something move in abdomen, giving sensation of bag filled with water. Cœliotomy January 16, '93. Cyst presented, fluid removed; not many adhesions; different cavities multilocular cyst emptied. Pedicle ligated including left ovary. Degenerated ovary right side; tube, containing pus, removed. Patient rallied well. Discharged nineteenth day.

CASE LXXXV.—Miss F. W., father died gastritis, maternal grandmother cancer stomach. Patient well and strong. Menstruated twelve, regular to one year ago, flow scanty, every three weeks. '89 abdomen became distended, gradually increasing. Contents abdomen and contour changed one side to other when changing position. Sense tension over abdomen and down thighs. Cœliotomy January 18, '93; Ovarian cyst, removed, with right ovary. No adhesions. Left ovary healthy and left. Recovery uneventful and discharged twenty-first day.

CASE LXXXVI.—Mrs. M. B., aet forty, father died of dropsy, otherwise family history good. '88 had peritonitis, more or less distension following; no further pain until '92 when soreness appeared in region umbilicus. Continued for two months, gradually left, but abdomen continued to distend. December 21, '92, was tapped, five gallons of thick jelly-like fluid being removed. Remained in bed three days. Fluid continued to ooze from opening made by trocar, for several days. Distension of abdomen not greatly relieved, but passed urine more freely and bowels moved readily. January 16, '93, saw patient with family physician. Measured nearly sixty-three inches at umbilicus, so tense and full it was impossible to distinguish between ascities and possible tumor, but from nature of tapping I believed she had a multilocular ovarian cyst. Pelvic examination of very little assistance, patient being so fleshy cervix could scarcely be reached. Cœliotomy done January 18, '93, eleven a. m. Some ascitic fluid removed, multilocular cyst of left ovary found, larger sac emptied twenty-seven pints thick, dirty fluid. Several smaller cysts opened and with sac weighed nearly four pounds. Patient found about four months pregnant, although she gave no rational symptoms of this condition. Right ovary and tube normal. She did nicely for forty-eight hours, when she suddenly developed active uterine pains and aborted, having sharp post-partum hemorrhage. Although pulse was good, and she rallied well from miscarriage, she kept up a constant state of worry and died January 23. Could this case have been reached earlier, particularly after first tapping, I believe her chances for recovery would have been very good.

CASE LXXXVII.—Mrs. F. K., family history good. Menstruated at twelve; regular. One child; no abortions. '85, while pregnant, fell, but did not hurt herself much. Soon after pain came in left ovarian region—more at times than others—when at work. After birth child somewhat worse. Pain continued; sometimes could feel bunch seemingly deeply located at umbilicus—left side—this region sore to touch. April, '92, growth higher up in iliac region; growth more rapid two months previous to operation. Cœliotomy January 23, '93. Tumor presented; nine pints darkish fluid removed with sac and left ovary; pedicle tied as usual—no adhesions. Upon examination right ovary small cyst found very adherent and held down firmly. This cyst also removed and pedicle ligated. Closed as usual. Patient made splendid recovery. Discharged twenty-third day.

CASE LXXXVIII.—Mrs. A. W. K., family history fair. Menstruated thirteen; always pain till age of twenty when child born—afterward menstruated regular. Had acid dyspepsia but general health better. '85 fibroid tumor uterus diagnosed. Menopause at thirty-five. '87 abdomen began to enlarge but did not pay much attention to increase in size till Xmas, '92, when she began to have severe pain left side and groin. For three weeks before operation was not able to lie down at night but slept in large chair. Since Xmas, '92, enlargement very marked. Was consulted December 31, '92, and advised an operation. Cœliotomy February 2, '93. Removed about twenty-five pints of dark fluid and large multilocular ovarian tumor, right side, found tube and ovary left side perfectly normal. Slight adhesions. Recovery. Discharged twenty-eighth day.

CASE LXXXIX.—Mrs. D. S., aet thirty-four, family history negative. Mother three children—five miscarriages. March, '92, very ill, giving history of probable pelvic peritonitis. Husband dissipated, and treated for specific urethritis. August, '92, patient had another similar attack. I saw her November 7, '92, advising removal uterine appendages, believing case one of double pyosalpinx, having specific origin. She did not reach hospital until February 8, '93, growing constantly weaker. Cœliotomy February 11. Tubes very much distended, filled with pus; large abscess on left side. Sac attached to rectum, very serious adhesions; operation long and tedious, but finally completed, cavity thoroughly flushed with hot saline solution and left in nice, dry condition, all bleeding points having been controlled. No drainage. Patient reacted well, kidneys did their work well, very little vomiting, and symptoms seemed favorable, but patient died in condition of exhaustion on third day.

CASE XC.—Mrs. E. D., family history negative. Menstruated at thirteen; normal. Inflammation bowels when sixteen; for two years following having attacks of malaria in summer. At twenty attacks bronchitis and asthma, occurring at intervals. February 28, '91, had bearing down pain, increasing every month until May when patient had pneumonia (doctor called in for uterine pain). Breasts became so large she could not wear corsets; abdomen bloated, pain in back and circulation poor. Under local treatment for three months patient relieved, but end of this period pains came on again, increasing every month. In May, '92, Dr. Brownell, Oneonta, N. Y., dilated cervix, but pain continued, although treatment carried out. Saw her October, '92; thorough cervical dilatation, but patient unable to wear stem pessary on account of pain; every month since pain increased in severity at flow. Cœliotomy February 13, '93. Pyosalpinx, both sides; parovarian cyst and structural change in left ovary. Removal uterine appendages. Stitches removed twelfth day. Discharged twentieth day. This patient finally made a good recovery, though having some of her old pains for a year afterward.

CASE XCI.—Mrs. A. W., family history good. Menstruated at fourteen, accompanied with pain for first three months; later painless until birth second child. At eighteen confined to bed with what physicians termed kidney disease. Passed urine frequently but small amounts; leucorrhœa. Since birth second child has had severe pain over ovarian region, especially marked left side. August, '92, sudden stoppage menstruation. Had cold, then high fever; lost much flesh; delirious for six hours. Constantly thirsty; passed large quantity urine. Prolapsed ovary, left side. Her physician stated that during summer of '92, urine contained sugar; previous to operation repeated examinations failed to reveal any. Cœliotomy February 16, '93. Left ovary prolapsed and degenerated, showing beginning tumor. Right ovary cirrhotic, with parovarian cyst near. Right duct stenosed markedly about one and one-half inches from ovary. Removed uterine appendages. Discharged cured March 4, '93. Patient in excellent health, June, '94.

CASE XCII.—Mrs. K. W., family history good. Menstruated fourteen to fifteen—no trouble—no children—no miscarriages. February, '91, had quivering pain left side, then went to other side, pains increasing every month. Consulted Dr. Magee of Lansingburgh who diagnosed ovarian trouble. Went

to bed till August, '92. In February, '93, pains came on again and I saw her March 13, '93, advising operation; coeliotomy March 18, '93. Both ovaries in state of cystic degeneration and removed. Vein in abdominal wall bled quite a good deal. Dr. Macdonald put in two deep sutures stopping all bleeding. Firm adhesions. Recovery. Discharged twenty-first day. Year later doing well.

CASE XCIII.—Mrs. S., aet twenty-seven. Confined normally about two weeks previously. Chills on fourth day, with high temperature; consulting physician curetted uterus thoroughly; some detritis. Patient improved, but relapsed in a few days when second curetting done. Case finally concluded to be one of pyosalpinx, I was telegraphed for, prepared to operate. No abdominal distension, temperature one hundred and four and upwards, decided chills, severe perspiration; no evidence of general peritonitis; bowels moving, but local tenderness over pelvic region. Uterus well contracted. Coeliotomy April 19, '93. Right ovary and tube enlarged, giving evidence of septic trouble, and removed. Good recovery from operation, but slight tendency to suppuration of one superficial stitch. Chills not controlled. Every medical aid given, but patient gradually grew worse, dying fourth day after operation. Examination of ovary removed did not reveal any marked septic suppuration. Case probably one of true septicæmia.

CASE XCIV.—Miss J. K., family history of phthisis. Patient rather delicate. Menstruated October, '92; regular until February, '93, when no flow up to time of operation. In February pain in right side, distending abdomen; increased after walking or meals, but improved by aiding digestion. Abdomen enlarged, and more or less pain. Coeliotomy May 2, '93. Diagnosis of tubercular peritonitis confirmed. Incision made and drainage continued. Patient left hospital twenty-eighth day. Later gave evidence of returning symptoms of disease, but afterwards improved.

CASE XCV.—Mrs. P. D., grandmother died cancer, otherwise history good. Patient always healthy. No children—no miscarriages. Menstruated regularly. '91 first noticed enlargement abdomen, about median line, some pain left groin. Never severe. Enlargement increased in size but did not influence her general health. Always able to do her work. Last few months distension somewhat more rapid. Coeliotomy May 4, '93. Diagnosis left ovarian cyst confirmed. Cyst removed. Bowels moved second day. Recovery uneventful. Discharged twenty-third day.

CASE XCVI.—Mrs. E. P., aet fifty, family history of cancer. '79 ovarian cyst removed from left side by Dr. Thomas of New York; menstruation normal until menopause, just previous to second operation. '89 right side began to enlarge until she was very much distended. Diagnosis of multilocular ovarian cyst. Coeliotomy May 16, '93. Diagnosis confirmed. Uneventful recovery. Discharged fifteenth day. Case of interest simply in being second operation, last incision being made through old cicatrix, which was found in good condition.

CASE XCVII.—Mrs. I. P., family history very good. Patient had grippe '89, health not good since. Menstruated at eleven; regular until two months previous to operation; since flow increased. September, '91, first child born; no miscarriages. August, '92, had what she thought a miscarriage, but attending

physician considered it an abdominal tumor. After this period noticed some enlargement of abdomen. but at menstrual periods seemingly less. Prolapsus since birth child. Worse in May, '93, and confined to bed. Severe pain in side and lower part back. At first occasional severe pain, but three weeks previous to entering hospital very severe. July 20, '93, saw patient; general peritonitis and so critical I tapped her, removing 108.5 c. c. coffee-colored fluid. Great relief followed, having good effect, with other treatment, in controlling peritonitis. Cœliotomy July 24, '93. Multilocular ovarian cyst; tapped from within, several places, to admit of removal. Adhesions very slight; easily separated by hand and sponge. Glass drainage; removed following morning; little, if any, discharge. July 28, stitches removed; patient discharged August 12, doing well. Patient gave history morning sickness, some nausea during day, but certain she was not pregnant and general report against such being the case, still uterus gave evidence of about three months pregnancy. In pelvic examination could isolate uterus, which was enlarged, and I said to her husband and friends I thought she might be pregnant. Later, this patient presented all the signs of pregnancy and was delivered at time of a fine, healthy child, since which time she has been in perfect health.

CASE XCVIII.—Mrs. M. F., father died cancer aet sixty; otherwise family history good. Menstruated about fourteen; regular. No children; no miscarriages; no serious illness, with exception small-pox. Says, however, at four years of age she had abscess in side. March, 25, '93, suddenly sick in night; feeling of weakness; next morning fainted several times, also vomited slightly. Eating caused cramps in abdomen. Diagnosis tubercular peritonitis confirmed when cœliotomy done September 7, '93. Peritoneum extremely adherent to underlying structures. Large sac presented, first supposed to be a cyst; to settle this point it was tapped and some fecal matter and gas escaped, so pronounced a distended colon. Opening in colon closed without drainage. Patient rallied well from operation. Stitches removed nine days after operation. Discharged September 20, '93. In excellent health six months after operation.

CASE XCIX.—Miss M. S., diagnosis of ovarian cyst; father killed; mother died of some form of heart trouble; one sister died of phthisis. No family history of cancer. Menstruated at fourteen; always regular. '78 noticed enlargement abdomen, supposed due to dropsy; not attended by pain, enlarging very slowly until '92, after which time it grew more rapidly; did not know which side enlargement appeared first. Cœliotomy September 8, '93; no adhesions; both ovaries removed; incision closed without drainage; wound healed without any unpleasant symptoms. Patient returned to her home feeling exceedingly well.

CASE C.—Mrs. E. G. D., father died disease of liver; mother of cancer stomach. Patient healthy until menstruation at sixteen; very painful in region right ovary; no children; thinks once pregnant, not menstruating for one and one-half months; called physician, who gave her something to make her flow; flow very profuse, and thinks since never pregnant. '89 severe attacks pain region right ovary; so severe could not bear feet on floor. '92 again very severe pain lower part abdomen; obliged to urinate every five or

ten minutes; vaginal douche relieved this, however. February, '93, dilated for anteversion, after which she improved slowly. July 5, '93, flowed; from 11th to 30th August flowed slightly every day; August 16th again seized severe pain region right ovary; September 6th flowed naturally. On examination uterus found empty, and tumor, large as an orange, present. Ectopic gestation diagnosed by physician, Dr. E. M. Pond, Rutland, Vt., immediate operation being advised. Brought to Albany hospital Saturday night September 16, '93. Cœliotomy September 17th, ten a. m.; right tube contained remains extra-uterine pregnancy; removed; pyosalpinx left ovary and tube removed; drainage introduced; patient rallied from operation well; glass drainage tube removed, rubber substituted, on third day; stitches removed ninth day, wound almost entirely healed; uninterrupted recovery, and discharged in good condition twenty-third day. Excellent health since.

CASE CI.—Mrs. E. W., family history of tuberculosis on both sides. Patient very delicate. Menstruated at fifteen; very irregular, painful and scanty, frequently confined to bed for two or three days; no flow three months previous to operation. Married twelve years; three children; no miscarriages; very difficult labors; pain in region right ovary eight or nine years; sensation of throbbing, and as though tumor size of an egg present. Family physician referred case to me for removal tubes and ovaries; diagnosed pelvic peritonitis and pyosalpinx, in which I fully agreed. Cœliotomy September 21, '93. Very many adhesions; both ovaries removed; drainage tube removed third day, stitches eighth. Patient did well, and discharged October 25, '93, in good condition. In excellent health June, '94.

CASE CII.—This illustrates the necessity of the surgeon not allowing the pleadings of the patient to move him in the least in his line of action. Mrs. J. C. D., aet twenty-eight; no children; irregular in menstruation. Saw her with family physician August 15, '93; menstrual period skipped six weeks previously; severe pain right side August 13th, with some shock and slight hemorrhage from uterus; patient grew rapidly worse on 14th, placed in bed, some shock and evidence internal hemorrhage during day; recovered during night, and on morning of 15th I confirmed her physician's diagnosis of probable extra-uterine pregnancy. Against our better judgment we yielded to her pleadings not to have an operation; she did nicely for three weeks; symptoms returned, and we operated on 21st September, removing four months' foetus, with placenta, also many clots from pelvic and abdominal cavity, right tube being implicated. Patient did not rally, and died twelve hours after operation. We should have operated at once upon presentation of symptoms so unmistakable.

CASE CIII.—Miss G. T., family history good. Diagnosed tubercular peritonitis, possibly ovarian tumor. Patient never strong. Menstruated at thirteen; never regular, and flow scanty. '91 caught in rain while menstruating, and dates illness from that time. Five weeks previous to operation abdomen enlarged rapidly, patient losing some in flesh; bowels and kidneys normal. Cœliotomy September 22, '93. Large amount reddish fluid removed from abdominal cavity, latter thoroughly washed out and glass drainage introduced; stitches removed ninth day; drainage on fifteenth day, when iodoform gauze substituted. Patient recovered without any unfavorable symptom, and discharged November 15, '93.

CASE CIV.—Mrs. M. V., family history of phthisis. Patient always healthy. Diagnosis of ovarian tumor. Menstruated at fourteen; regular; summer '92, skipped two months without flowing. Patient aet fifty-two time of operation. Since October, '92, menstruated more or less continuously. June, '93, first noticed abdominal tumor, although she thought abdomen was getting larger before this. August, '93, had severe pain, lasting about one week. This especially severe when attempting to work. Could not lie down, but had to be bolstered up in bed. Cœliotomy September 23, '93. Large ovarian tumor right ovary. Seven quarts fluid removed. Some adhesions. Good recovery; clean, fine wound. Discharged twenty-third day.—(*To be Continued.*)

Announcement of the Twenty-second Annual Re=union of the Association of the Alumnin of the Albany Medical College.

The Association of the Alumni of the Albany Medical College will hold its Twenty-second Annual Re=union on Tuesday, April 16. The order of exercises for the day will be as follows:

9 A. M.—Reception in library. Coffee and sandwiches served.

10:30 A. M.—Annual meeting in Alumni Hall. Programme: 1. Faculty address of welcome, by Prof. Bigelow, M. D.; 2. Minutes; 3. Reports; 4. President's Address; 5. Report of historians and class historians of '55, '65, '75 and '85; 6. Election; 7. Miscellaneous business; 8. Reading of letters, etc.; 9. Impromptu speeches.

12 M.—Lecture by Dr. Theobald Smith ('83) of the Bureau of Animal Industry, Washington, D. C., on "Serum Therapy, with special reference to diphtheria."

3 P. M.—Commencement exercises at Harmanus Bleecker Hall. Address by Rev. Wm. Foot Whitaker, Albany.

8:30 P. M.—Annual Banquet at Odd Fellow's Hall.

You are cordially urged to be present. Please notify the corresponding secretary of your intention and inclose your photograph, for Alumni collection, unless previously furnished. Adam T. Van Vranken, ('73), M. D., *President*.

Charles M. Culver, M. D. ('81), *Cor. Secretary*.

36 Eagle street, Albany, N. Y.

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ANNOTATIONS.

Electrical Terms.—The “volt” is the unit of measure of electro-motive force which will circulate a current of electricity of one “ampeer” through a resistance of one “ohm.”

The “ampeer” is the unit of measure of the volume of the “volt” or “strength” of a current. The “ohm” is the unit of measure of the resistance of the circuit.

The number of ampeers flowing through any circuit is equal to the number of volts of electro-motive force, divided by the number of ohms of resistance in the entire circuit. (Ohms Law.)

The term “electro-motive force” is used to designate the pressure or head under and by virtue of which an electric current circulates. This is created by a “difference of potential” causes, from the two sides of the source of supply.

“Difference of potential” corresponds to a difference in level in hydraulics or a difference in temperature in thermodynamics. A current will flow from a higher or “positive” potential to a lower or “negative” potential, as there exists a difference of potential.

The “coulomb” is the established unit of measurement of the quantity of the current, and its value is equal to that quantity of electricity which will flow through or into a body when one ampeer of strength flows for one second of time.

—*Electricity.*

Hints on the Administration of Trional.—Dr. C. Goldman (*Therapeutische Monatshefte*, November, 1894) has employed trional in a considerable number of cases of insomnia not due to pains,—especially in neurasthenic sleeplessness, and with but few exceptions obtained from 1.0 gm., a sleep of at least six, and usually of eight hours duration. Unlike most other hypnotics the patients experienced no after-effects and felt as well on the following day. With a view of enabling others to derive the best results from this hypnotic, the author presents the following hints based upon an extensive experience, in regard to the administration:

“Trional should never be administered in doses exceeding 2.0 gm. In all cases where the insomnia is not due to pains, sleep of six to eight hours duration is usually obtained from doses of 1.5 gm. In neurasthenic sleeplessness the administration of 1.0 gm. is ordinarily sufficient to produce sleep.

Trional should never be taken in the dry state or followed by a drink of cold water, but simultaneously with its administration a large quantity of fluid as warm as possible. About a cupful should be given, as for example, soups, teas, etc. Absorption of trional is thereby facilitated, and a prompt effect secured.

During the employment of trional it should occasionally be discontinued. No practical physician will administer a hypnotic for a week, or as appears from the literature for a number of months.

To guard against any possible accumulations of an unabsorbed trional, accelerate its elimination, and thereby prevent reduction of the alkalinity of the blood, some carbonated mineral water (Seltzer, Appollinaris) should be prescribed during its period of administration. It is also advisable to give at the same time, some salt of citric or tartaric acid. The vegetable acids are converted into carbonates in the organism, and then increase the alkalescence of the blood.

If in spite of these precautions constipation occurs, it should be promptly relieved by seidlitz powders or similar laxatives.”

The Effect of Iodoform on the Tissues.—L. V. Stubenrauch has recently completed an exhaustive experimental study on this subject (*Deutsche Zeitschrift für Chirurgie*, 1893, B. xxxvii., Hefte 5 u 6.) The investigation was suggested by the very frequent use of iodoform in local tuberculous affections and the good results so frequently observed. Many writers hold that the effects noted in these cases are due to the anti-bacillary action of the drug, by which the tubercle bacilli are destroyed. The effect of iodoform on the tissues had not been studied, however and Stubenrauch therefore determined upon the work of which this communication is the outcome.

The effect of iodoform upon the tissues of the body, both normal and pathological, were carefully investigated. Observations upon man have been compared with similar experiments on animals.

The work is divided into four parts: 1. Historical. 2. Bacteriological. 3. Chemical. 4. Histological.

The author arrives at the following conclusions:

1. Iodoform is not an antiseptic in the true sense of the term, as is corrosive sublimate, inasmuch as it does not destroy bacteria by short contact. The investigations heretofore made upon several different bacteria have shown that iodoform only inhibited the growth of milzbrand and tubercle bacilli.

Iodoform probably possesses no specific anti-tuberculous effect. Experiments on pure cultures of tubercle bacilli have repeatedly shown that when the iodoform remained in contact for a long time the growth was arrested, but it was not possible to destroy the vitality or growth of fully virulent tubercle bacilli by contact with iodoform in the animal body.

The favorable results which follow the iodoform treatment in cases of chronic tuberculous abscesses must not be taken as unconditional proof of the specific anti-tuberculous (anti-bacterial) effect of iodoform. The bacilli which are contained in tuberculous abscesses die under the influence of iodoform, but it is not proven that the destructive effect is primarily due

to the iodoform; there is a greater probability that the effect of the latter on the tissues, in connection with the experimentally proved slight anti-bacterial effect, has caused the destruction of the bacilli. Iodoform interferes with bacterial growth — if ever — in the undecomposed as well as in the decomposed condition.

2. The decomposition of iodoform can take place outside the body as well as inside.

a. In solutions (ether, alcohol, or oil) or mixtures (water, gum or glycerin) which are exposed to the sunlight. In the mixtures, decomposition of iodoform takes place in a warm place even if light be excluded, the rapidity depending upon the degree of temperature. The effect of live steam on iodoform mixtures or emulsions is to separate certain quantities of iodine (and hydriodate) and form new compounds, or they remain free, according to the nature of the different organic substances which are present. The quantity of iodine which becomes liberated from iodoform at 98 or 100 is according to the nature of the several vehicles, and the greater or less excess of air, but is independent of the form of the preparation. Considerable decomposition takes place in iodoform by the heat of live steam in glycerin.

b. Iodoform is further decomposed outside of the body by the liberation of hydrogen, and further through reducing substances — as, for example, powdered zinc, silver — and also through neutral nitrate of soda (with the addition of heat), and finally through the products of the bacteria (ptomaines). Inside of the body there is decomposition of iodoform in considerable degree, especially in wounds in which there is active reduction (and where ptomaines are also present), in the cellular tissue under the skin, in the intestinal tract, the great cavities of the body, etc. With the albumin of the tissue juices the iodoform unites to form iodalbumin, which when liquid may be absorbed; if not, it decomposes further. The iodoform leaves the body in the form of soluble combination. The local as well as the general effect of the iodoform is a protracted iodine effect.

3. Iodoform acts on the tissues of the body, however, only if it is decomposed. Locally as well as from the blood it acts on glandular organs to such a degree that degenerative decay of the epithelial elements takes place. In this way the local application of iodoform to the kidney produces a degeneration (fatty) in the epithelium, and also a decay (fatty) of the cells in the kidney, liver, and other organs, if the iodoform has produced a general effect. All pathological new formations are influenced in a high degree by iodoform. Iodoform stops the formation of giant cells in the tissues in the neighborhood of a foreign body.

In serous cavities it causes coagulation of albumin, which, if the conditions of absorption are favorable, soon disappear. If the iodoform becomes decomposed and if certain products of decomposition remain for a long time in the cavity in consequence of unfavorable conditions of absorption, as in hydrocele, etc., they (these products of decomposition) are capable of causing an inflammation in the walls of the cavity. The effect of this is a transudation which coagulates, becomes organized, and cure results by the formation of connective tissues.

On tuberculous tissue iodoform acts probably by hastening the decay of the epitheloid cell collections which are destined to degeneration, while the more resistant of the epithelial elements is prepared for a change into healthy tissue.—*The American Journal of the Medical Sciences.*

Freckles.—A paragraph seasonably going the rounds of our exchanges attributes to Hager the assertion that freckles can be removed by the application every day, of an ointment composed of white precipitate and subnitrate of bismuth, each one drachm; glycerine ointment, half an ounce.—*The Canada Lancet.*

A Good Example.—The city of Sydney, Australia, has imposed a fine of one pound sterling upon any person convicted of spitting upon the floor of public buildings or upon the street.—*Boston Medical and Surgical Journal.*

The Hygienic Aspect of Nervous Prostration.—The late Dr. Dio Lewis, to whom we have more than once referred, was a very original man, and there was a world of wisdom in many of his original suggestions.

Upon one occasion, when he was consulted by a fashionable young lady, who complained of being “utterly run down,” and whose vital functions were much depressed, he regretted his inability to do her any good, because, as he said, he was quite sure that she would be quite unwilling to take the medicine that he would prescribe.

Being assured that she would take, or do anything that would cure her, Dr. Lewis seized a prescription blank and wrote,—

R Bedibus nineo'clockibus.

Sig.—To be taken every night.

The young lady asked, in amazement, what this jargon meant, and Dr. Lewis replied: “Oh! that is what we old foggy doctors write when we want our patients to go to bed at nine o'clock.” “But I can't do that, because I have so many evening engagements,” was the reply; “I will take any drug, but I cannot go to bed at nine o'clock.” “So I thought,” said Dr. Lewis; “I was sure that you would not take my medicine, and I cannot cure you.”—*Exchange*.

Jewish and Christian Butchery.—In 1891 Dr. Dembo, of St. Petersburg, was commissioned by the Russian government to report on the various methods of slaughtering animals practiced in the different countries of Europe, from the humanitarian and the hygienic points of view.

The results of his inquiries were published last winter, and have been translated into several languages; while at Berlin they have been verified scientifically and practically by Dr. Kruger in the laboratory, and by Mr. Hoffmann, the director of the municipal slaughter-houses, which are well known as the most perfect in the world. The methods in question are: (1) The Jewish Schechita, or the complete severance of the carotids and jugulars, and consequent rapid withdrawal of the greatest possible volume of blood. (2) The Gentile methods, in which attempts are made to deprive the

animal of consciousness by (*a*) stunning or (*b*) by pithing; the former including the English hammer and pole-axe; Brunneau's mask which, besides blindfolding the ox, holds in position a nail which is driven through the skull by a blow from the hammer; and Sigmund's, in which a percussion shot is substituted for the nail.

Decomposition begins sooner in the less stable tissues, and first of all in the blood; the more rapidly and completely, therefore, the vessels are evacuated, the longer does the meat remain fresh and wholesome. The entire extinction of life is marked by the loss of electric irritability and the appearance of rigor mortis, due to the action of lactic acid on the myosin. Dr. Kruger found that in a number of rabbits, some of which were killed after the Jewish method and others by stunning followed by sticking, the average time after death at which rigor set in was one hour and ten minutes in the former, and two hours and thirty-five minutes in the latter; decomposition commencing on the thirteenth and eighteenth days respectively, the temperature having been meanwhile maintained between 3 and 7 C. (37.5–44.5 F.).

The vasomotor paralysis that follows stunning tends to retain the blood in the dilated vessels; while in the Schechita, arterial tone is unimpaired, the rapid reduction of pressure withdraws fluid from the tissues, and the flesh is as firm in two hours as after other methods in ten.

Against these palpable advantages of the Jewish method the charge of cruelty has been persistently urged, although it must be evident that the sudden cutting off from the brain of its blood-supply, except the small quantity brought by the vertebral arteries, must involve almost instant loss of consciousness. The epileptiform convulsions, which have been taken to indicate intense agony, are the consequence of cerebral anæmia and evidence of unconsciousness. Even the movements of the pupil on being touched, which may be observed fifteen seconds after the Schechita, are merely reflex; it is well known that fowls will run and ducks swim without their heads, and Dr. Dembo, by stimulating the

appropriate points, has induced the trunkless head of the ox to open its mouth and protrude its tongue, all suggestions of consciousness being absurd.

Indeed, there is reason to believe that a beast slaughtered in the Jewish manner does not retain consciousness for more than three to five seconds, and it is very doubtful whether it feels pain for half that time.

On the other hand, it is seldom, indeed only by a lucky chance, that the ox falls under the first blow of the hammer, five or six being about the average number required, and then it must not be forgotten that unconsciousness does not always accompany motor paralysis.

But barbarous as pole-axing may be, Dr. Dembo has proved that the French method of pithing is simply diabolical. The knife is commonly supposed to divide the medulla above the decussation, thus paralyzing every faculty simultaneously. This, however, is well nigh an anatomical impossibility, and, as he has demonstrated by numerous post-mortem examinations, it is the cord only that is actually reached. Motor paralysis is complete, but circulation and respiration proceed as before, and consciousness remains intact long after the process of flaying, etc., has commenced.

Mr. Hoffmann has already introduced the Schechita in the municipal slaughter-houses at Berlin, and is supported in a report on the question by no fewer than fifty University professors, one hundred veterinary surgeons, and a large number of master butchers throughout the empire.—*The American Journal of The Medical Sciences*.

Two Excellent Hints for Practitioners.—Dr. Cocksedge, of Wales, places the following “tips” at the disposal of his brethren: If you have a fatiguingly deaf patient to talk to, place the ear-pieces of your binaural stethoscope in the patient’s ears, and talk into the chest-piece, and you have an excellent ear trumpet. If you leave your spectacles at home, being old and apresbyopic, make a hole with a pin in the corner of your visiting card, and you can read your clinical thermometer or anything else.—*Medical Press*.

REVIEWS AND BOOK NOTICES.

The Principles of Surgery and Surgical Pathology: General Rules Governing Operations and the Application of Dressings.—By Dr. Hermann Tillmanns, Professor in the University of Leipzig. Translated from the Third German Edition by John Rogers, M. D., New York and Benjamin Tilton, M. D., New York. Edited by Lewis A. Stimson, M. D., Professor of Surgery in the University of the city of New York, Medical Department, with 441 Illustrations. New York: D. Appleton & Company, 1894.

This is a most excellent work, and one worthy the confidence of the profession.

The translation by John Rogers, M. D., New York and Benjamin Tilton, M. D., New York, is thorough and complete. Among the many works published to-day on surgical pathology, there are few so concise and so warmly meriting the approbation of the profession.

The publishers do their work in such good style, always, that it is only necessary to say this book is no exception to their general perfectness.

Surgical Pathology and Therapeutics.—By John Collins Warren, M. D., Professor of Surgery in Harvard University; Surgeon to the Massachusetts General Hospital. Illustrated. Philadelphia: W. B. Saunders, 925 Walnut street, 1895.

This work is a thoroughly original and representative one on the subjects to which it refers. The profuse illustrations are chromo-lithographic productions from original drawings, making it an exceedingly rare and valuable volume. It reflects careful research, much study and observation on the part of its conscientious author. The profession are certain to express their appreciation of it, and beyond a doubt it will find its way into the libraries of the thoughtful, careful students in surgery. Dr. Warren is to be congratulated upon having accomplished his work so well. One sees, in it, the

promises of other volumes to follow, which is devoutly to be hoped. An author who does his work so well as Dr. Warren ought to give to the profession all that his strength and time will permit.

The publisher has certainly done his part nicely, and in keeping with many other volumes sent out by him. The profession in America have reason to rejoice that he does his work so well.

The International Medical Annual and Practitioners' Index: A Work of Reference for Medical Practitioners.—1894; Twelfth year. New York: E. B. Treat, 5 Cooper Union. Chicago: 199 Clark street. Price, \$2.75.

This is a very handy *Annual* in which one can obtain in a condensed form the fresh accessions to the medical science during the year 1894.

The entire work is contained in one volume of about 700 pages, making it very convenient for reference.

The distribution of surgical the subject is as follows: There is first a Dictionary of New Remedies occupying forty-seven pages, containing also an excellent article by Prof. H. A. Hare, on the "Therapeutic Gains of the Past Year."

The Dictionary of New Treatment follows,—occupying the greater part of the bulk of the book. Among the articles in this part especially to be noticed is an elaborate contribution by Dr. James Shaw, of Liverpool, on "Facial Expression in Insanity," fully illustrated by cases from life.

Then follow short resumes of the "Progress in Sanitary Science and Pharmacy." A description of new medical and surgical appliances. And a list of medical publications, mostly in the English language, for the past year. A complete general index closes the book.

This is the twelfth year of this publication. It is a reliable concise exposition of current literature, carefully edited; abounds in illustrations, and for the great amount of valuable information contained within its pages, the book is remarkably cheap.

Text-book of Hygiene: A comprehensive Treatise on the Principles and Practice of Preventive Medicine from an American Stand-point.—By George H. Rohé, M. D., professor of therapeutics, hygiene and mental diseases in the college of physicians and surgeons, Baltimore; superintendent of the Maryland Hospital for the Insane; Member of the American Public Health Association; Foreign Associate of the Société Française d'Hygiène, etc. Third edition, thoroughly revised and largely rewritten, with many illustrations and valuable tables. Royal octavo, 553 Pages. Cloth, \$3.00 net. Philadelphia: The F. A. Davis & Co., Publishers, 1914 and 1916 Cherry street.

A knowledge of hygiene or preventive medicine is valuable alike to the physician and layman, and a good work written on this subject differs from almost all other medical treatises, in that it can be put into the hands of both men and women in the various walks of life with safety, and generally with profit.

To the physician, a comprehensive knowledge of hygiene is of the utmost importance, as he has almost daily opportunities of turning it to the best advantage. His advice is constantly asked about matters connected with this important branch of medicine; and it is to him, especially, that he may rationally and in a scientific manner answer the questions put to him and follow out the precepts of hygiene, that this work has been written.

This text-book on hygiene has been subdivided into twenty-three chapters, each of which deals with some important subject, as follows: Air, water, food; soil; removal of sewage, construction of habitations and of hospitals; school, industry, military and camp, marine and prison hygiene; exercise and training; baths and bathing; clothing; disposal of the dead; the germ theory of disease; contagion and infection; history of epidemic diseases; antiseptics, disinfectants and deodorants; vital statistics; the examination of air, water and food; quarantine; and index.

Each of the topics taken up under these separate heads is ably treated, and the most recent advances in sanitary science are noticed.

It is an efficient, reliable and scientific text-book of hygiene.

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Certain Conditions of the Rectum and Their Effect in Chronic Diseases, with Illustrative Cases.*

LEWIS BALCH, M. D., ALBANY, N. Y.

It is a well-known and recognized fact that many of the "ills to which flesh is heir to," are either caused or aggravated by reflex action. It is only necessary to call attention to the general nervous and dyspeptic symptoms attendant upon some local disease of the uterus to explain what is meant. Relieve the local condition and you get rid of the general ones; neglect the local, and nothing but failure is experienced in the treatment of the general. And, as this is true of one organ, it is so of all, and I propose, this evening, to present some cases of irritations within the rectum which had marked expression upon the general health of the patients.

Functional life may be said to be in charge of the sympathetic nerve system and anything that irritates its branches is, by reflex action, manifested by interference with some function essential to well being. The sympathetic system being distributed to the involuntary muscles of the body, those muscles having the chief charge of the functions of circulation, respiration and digestion, we find it well represented by numerous filaments in and about the sphincters of the lower orifices of the body. It can be readily understood, this being the condition, why irritation of these sphincters, or of

*Read before the Medical Society of the County of Albany, March 27, 1895.

the involuntary muscular tissue near them, cause increased and uncalled for action—in the sense that this action is not necessary for the animal economy—of the contractile fibres. And, as they are thus excited to undue and constant contraction, they, in their turn, cause abnormal irritation and exhaustion to the sympathetic nerves with which they are supplied and this re-acting upsets, in a greater or less degree, the functional life presided over by the parent trunks or ganglionic centres. Contractions of involuntary muscles are, if the expression may be used, unreasoning. When the consciousness of the individual bears a part, the contraction of the voluntary muscles can be subject to the will, but with the involuntary muscles the will cannot exert any appreciable effect; they are going to contract as long as the irritation lasts, whether such action does harm or not. A simple example illustrates my meaning. The tenesmic spasms of the rectum in dysentery are useless, in fact are harmful, and yet the bowel will keep on contracting, trying to expel something, when nothing is present, simply because its involuntary muscles are irritated and act without thinking.

When sensory filaments are involved in this pressure, whether it be by contraction of irritated sphincter muscles or by the expansion of tissue from inflammation, we have pain as an exhibit of what is taking place, and this is often felt at a distance from the seat of the irritation causing it. But no pain may be present, the reason for the functional disturbance of the circulation or digestion not involving sensory nerves. Pain may be secondary, and be manifested in the place where the functional derangement is greatest and not be relieved until the cause of the reflex action is removed. Hence, many cases where the interference with normal functions is due to irritation of the sympathetic nerves in the rectum, are not recognised as having this for their origin, but are treated with varying results, the diagnosis placing the primary starting point where the manifestation of discomfort is found, and patients go from doctor to doctor, getting relief for a time from each consulted, but relapsing again as

the treatment apparently loses effect, until all faith is lost in learned physicians and medication. I think every one of us have had cases of this character. That the majority of these patients can be permanently relieved by proper attention to the abnormal conditions of the vagina, urethra, uterus and rectum, I believe. I wish to be clearly understood as saying that orificial surgery will not cure every disease man suffers from. I do not believe we "cure" anything. All we can do is to aid nature and help her by relieving some things she is powerless to do for herself. We do not "cure" a patient when we amputate a crushed limb, or remove an inflamed and suppurating vermiform appendix; we only come to nature's aid to do that which she cannot, and which if not done results, as a general rule, in the death of the patient.

So with operations upon the rectum. While the result of some simple surgical procedure on that organ may be most brilliant, and the patient regain the health he thought was lost, the cure is not effected by the surgeon, but by nature, who, assisted by the operator's skill, has renewed normal functional activity and restored the sufferer to the healthy state.

With this understanding as to what may be expected in chronic cases where irritation or disease of the lower orifices exists, I will speak briefly of some anatomical features about the rectum, and then recite a few cases in support of the theories advanced.

For the present we will only glance at the last inch or so of the rectum, that part which is grasped by the lower sphincters, the external and the internal. Here we meet with a fairly redundant mucous membrane, thrown into vertical folds, more or less marked by the *columnæ recti*, or columns of Morgagni. These columns consist of longitudinal bands of muscular fibre, terminating above and below in the elastic tissue. Between the columns, at their base, pockets or sacculi are found, but not to the same extent in every rectum. They are more frequent in the aged, and in some cases the mucous membrane being thin and abundant,

you can, by means of a blunt hook, find apparent pockets, where in reality none exist, for it is an easy matter to pick up the membrane on the end of the hook and invaginate it, giving in this way the appearance of a large and loose sac. But this is not the pocket we are looking for, and in some rectums you may not find any. In other cases, however, the hook will pick up not a fold of mucous membrane, but a true margin of one of these sacculi, and it is readily distinguished by its margin, formation and general characteristics. Some authors consider these pockets not only normal, but necessary to the act of defecation, as it is claimed mucous for lubrication of the parts is contained in them and pressed out as the rectal contents are expelled; but, although much discussion has arisen about these pockets, it is not necessary for us to enter upon the question of whether they are anatomical or pathological. The question is, whether they are injurious or not, whether they are necessary for the function of the rectum, whether surgical attention should be given them, or whether they should be left severely alone. Of course, when they become inflamed, their removal is called for, but I consider attention should always be paid them, and if the slightest sign of inflammation be seen, or, if without that, some fecal matter be found caught in them, then removal should follow. They become, under such conditions, irritants in earnest, and not in a healthy manner, for they excite constant contractions of the sphincters and thus cause undue pressure upon the sympathetic nerves, with the attendant evils of exhaustion and reflex action.

Oftentimes, in examining a rectum, there will be found, and generally growing from the margin of a pocket, papillæ. Their position is not constant, neither is their presence, that is, they do not make themselves seen unless pathological change has taken place. It is claimed, by some, that these papillæ, enlarged and irritable as they are, are normal and act as excitants to the rectum, bidding it attend to business and do as it ought to do, contract and expel its contents. But this view is not one borne out by fact, for were it correct,

we would always find them active and aggressive, whereas the true state of the case is we only find them when there is some abnormal condition of the intestine; when some feature in the patient's history leads us to suspect trouble in the rectum as the cause, or one of the causes, of the illness complained of. That they are irritating, and highly so, is undoubted, for generally they are very sensitive to touch, although their presence gives no pain to the patient unless they are touched, and the irritation caused by them is not beneficial, it is injurious, for like the inflamed pockets, the irritation gives constant and increased action to the sphincters, and the sympathetic nerves suffer.

In addition to the sphincters, the muscular coat of the rectum is also irritated by these conditions and we have it forced into activity when no normal reason exists for such work and consequently, by undue use, its functional value becomes impaired.

When these two conditions exist, you are also liable to have hemorrhoids, as the irritation from the inflamed pockets and papillæ, acting upon the muscular coat of the gut, constricts the veins passing through, dilating their distal extremities, and thus, in time, forming pile tumors.

The vaso-motor system of nerves having charge of the process of circulation, when any cause reflects upon it, we have as a result impairment of the circulation or some interference with its normal functions. To have a healthy state of the body, we must have a strong and normal circulation. Interference of an irritating character with the nervous system governing the circulation, re-acts upon the blood supply and makes it too fast or too slow, or may cause stasis in some part, to be followed by necrosis of the portion so affected. This action may be local from undue congestion, and may be had in a part without sloughing, but, while the pathological condition is local, the effects of this condition are general, and we may find the whole economy partaking in some degree in the disturbance caused by the local irritation. As an instance, the cold hands and feet usually present in those

suffering from some uterine trouble may be cited as an example. The patients keep about, they attend to their daily duties, they complain at times of, mayhap, some pain or weariness, but they don't give up; instead, they continue to drag on their lives with but little comfort. While the local disease is not so severe as to compel a retreat to bed, it still is sufficient to give irritation to part of the vaso-motor system and this re-acting, causes impaired circulation and the patient is not well, nor will be, until the cause of the trouble is removed and the circulation restored to its normal state.

If you will examine a perfectly normal and healthy rectum, the mucous membrane will be of a clear pink color, darker at the anus; the sphincters will be firm, but yielding; the passage of a finger is easily accomplished and is done without pain, and also without pain the sphincters can be well dilated. Take, on the other hand, a rectum where piles, or inflamed sacculi, or irritable papillæ exist, and you will find the mucous membrane congested, examination with the finger gives pain, the sphincters are hard, tight and unyielding and dilatation of them requires force. The reason for all this is easy to assign. The pathological conditions existing in the rectum have caused long-continued and irritable contractions of the sphincters, until a state of almost chronic spasm is present. This chronic contraction gives undue pressure upon the nerve supply, with its consequent exhaustion, and when no sensory filaments are involved no pain is present to call our attention to the part, but which, nevertheless, is, by reflex action, causing some functional disturbance, as a result from which the patient suffers. In such cases treatment of the functional difficulty is but palliative. The patient may get better for a time, but a relapse is almost certain. The long continued reflex irritation which, if, in the beginning, had been relieved by the removal of the cause, becomes in time so chronic that even if the cause is removed, further treatment has to be given for a secondary abnormal condition, if I may so phrase it, before the patient recovers his general health. The operation upon the rectum, when the effect upon

the reflexes is from that organ, is the first true step toward recovery. When performed early in the case it is generally all that is necessary, but we usually see these cases when the chronic stage has been well established, and then much remains for the physician in the after treatment before success is gained. The operation is necessary to start in the right direction, and the physician will find it aid the remedies he prescribes and enhance their action. I quote from my note book, a few cases illustrating what has been said :

CASE I.—July 2, 1884, Mr. C., a clergyman, about thirty-eight years of age, unmarried. The patient was brought to me by his physician, and gave the following history: He had been suffering from nervous prostration and dyspepsia for over a year, was very thin, had to be careful in diet, and found he could not do his pastoral work on account of the pain in head and back of neck. He had been under the treatment of physicians in New York and as long as he kept quiet he improved, but when he resumed his duties his troubles returned. Examination showed a congested anal mucous membrane, tight and hard sphincters and a complete phymosis. Patient was etherized and the phymosis first relieved by circumcision. On examining the rectum, two small piles, internal, and some papillæ were found. These were removed. Owing to my leaving town the next day, the further history of the case was given me by his physician. There was no rise in temperature. The circumcision healed by first intention. Bowels moved on the third day without pain, and all functional symptoms were relieved. The patient eat anything he wished and no distress was experienced. October 2d, patient was reported by a relative as being "wonderfully improved." In November Mr. C. called on me to report his condition. He had gained thirty pounds in weight since the operation. His head no longer troubled him, and he could prepare his sermons and do his parochial work without the mental suffering formerly experienced. His dyspepsia was much improved, as was evidenced by his condition, but he still had some pain in the great intestine. This acted in the manner of what is commonly called "wind colic," and sometimes was in the ascending and sometimes in the descending portions. The bowels moved naturally and without medicine. Examination of the rectum showed a normal condition.

CASE II.—Miss T., aet thirty-six, teacher, was sent to me by her physician, with the following history: Fifteen years ago she had a severe attack of typhoid fever. Her bowels, when convalescing, were allowed to become constipated, and for three weeks she had no passage. Since then she has had movements only under the stimulus of medicine. She complains of some pain at the menstrual periods, has cold hands and feet and is very nervous; also suffers from headache and indigestion. Two years ago she had rectal dilatation performed in Philadelphia, and since then has, at times, used rectal bougies to keep the external sphincters free. Examination showed congested membrane, two small piles, two inflamed pockets and some irritable papillæ. The clitoris was bound down within its hood. The os uteri was small and contracted. There was no leucorrhœa. October 4, '94, the patient was etherized. The clitoris was liberated from its hood, smegma being found. The uterine os and canal were dilated, and the piles, pockets and papillæ removed. Temperature the evening of the operation, 100 1.5° F. October 5, temperature 99°. Patient did not have a good night, but suffers no pain this morning. October 6. Temperature normal, and from this on continued so until she was discharged. On the 7th the bowels were moved by an enema without pain, and on the 15th they moved slightly without any aid. On the 17th the patient returned home. The bowels had continued to move without stimulation, her digestion was greatly improved, she was less nervous, the cold hands and feet were warm, and she only feared her improvement would not last. In February I was told her physician reported her to an oculist in this city, to whom he had brought another patient, as being in excellent health. Before operation her condition was such that she could not do any work, as her strength and head did not permit constant application. Now she has secured employment as stenographer and typewriter, and has no difficulty in attending to her duties. Her dyspepsia has disappeared, she does not suffer from headache, and her bowels move regularly without medicine.

CASE III.—Miss B., aet twenty-five, no occupation. This patient was brought by her physician, who gave the history of great pain from some piles which would come down and compel her to stop wherever she could in order to replace them, before she could continue moving about. The diges-

tion was impaired, and headaches constant. Bowels irregular, at times loose, at others constipated. October 23, '94, patient was etherized, and examination showed a tight sphincter with three external piles, two inflamed pockets and some irritable papillæ. The uterus was found normal. The piles, pockets and papillæ were removed, wound dressed and patient put in bed. October 24, temperature normal, and remained so throughout. Had a fair night, with but little pain. October 26. Did not have a good night, and has headache this morning. Moved bowels by injection. Patient has been contracting the sphincter voluntarily, so the bowels were allowed to move as large masses of feces as possible. This gave a little pain but did no harm to the wounds, which are healing nicely. October 27. Bowels became loose and a slight diarrhœa set in. Patient feels better and brighter. Wounds doing well. The sphincter is much softer, and the passages do not seem to interfere with healing. November 2d. Bowels are now acting naturally. Wounds nearly entirely healed. Patient is allowed up, and put under her physician to finish the case. He reported in December she was perfectly well, and no return of the rectal difficulty was manifest.

CASE IV.—Miss K., æt twenty-six, housekeeper; was brought by her physician, with the following history: She has suffered from acne-vulgaris for the past six years, and so badly that the face is pitted, and she dislikes to go out on account of her appearance. With some slight indigestion and cold hands and feet; she otherwise complains of nothing else. Appetite poor. October 28, '94. Patient etherized. Examination shows highly congested rectal mucous membrane, tight and hard sphincter, three large rectal pockets very much inflamed, one ready to suppurate, and three inflamed papillæ. No hemorrhoids. Clitoris deeply imbedded in hood, with a great deal of smegma. Vagina contracted, and a small ulcer on the os uteri. The rectum was relieved of its diseased sacculi and papillæ, the clitoris released, the vagina dilated and the ulcer curetted. October 29. Temperature normal, and continued so throughout case. Had a fair night. Having a good deal of pain in rectum and bowels this evening. Directed a hot pack to the parts, which gave relief. October 30. Better. No pain. Wounds doing well. October 31. Had a good night. Some pain this morning, and a feeling as if bowels were going to move. An enema was given, and after the passage pain all disappeared. Wounds

doing well. November 2d. Doing very well. Eats more and sleeps well. Bowels acting naturally. Face clearing up. Hands and feet warm. November 10. Patient well. Her spirits are excellent. Face has entirely cleared up, and no acne is to be seen. The patient returned home to-day. November 28. Heard from patient to-day, who states she is better in every way. The face remains clear. March 25, '95. To-day the patient's physician reports as having heard from Miss K. She has had one return of her acne, which readily yielded to treatment with Fowler's solution, and again her face is entirely clear. In all other respects she reports herself as being greatly better than before the operation. In fact, she says she is "perfectly well."

CASE V.—Mr. G., aet thirty-six years, teacher; married. This patient was brought to me by his physician, with the following history: Has been generally run down by over work. Has eczema of both legs and pruritus ani. Hands and feet cold at times. December 6, '94. Patient etherized. Examination shows rectal mucous membrane congested, sphincter hard and tight, two small piles and two papillæ. The urethra was free from stricture. The piles and papillæ were removed. December 7. Did not have a very good night. Suffered some pain. Temperature 99°. Dressed wounds, which relieved the pain. December 8. Temperature normal. No pain. Wounds doing well. No complaint of the pruritus. December 10. Bowels moved yesterday with enema. No pain. Patient feeling well, and wants to get up. Temperature normal. Pruritus all gone, and eczema disappearing. December 21. Being healed, patient is allowed up. The eczema has all cleared up. Feet and hands warm. Bowels regular. General conditions excellent. Appetite improved. March 25, '95. The physician reports him in excellent health. He has had no return of either the eczema or the pruritus, and he has been able to attend to his duties all winter without discomfort. He has gained fifteen pounds in weight since the operation.

The Nervous Symptoms Associated with Bright's Disease.*

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In the series of discussions on the various phases of renal disease in which this society is this winter engaged, our president, Dr. Ball, has assigned to me the subject of "The Nervous Symptoms Associated with Bright's Disease," excluding delirium and other forms of insanity symptomatic of Bright's disease, which are to be considered by Dr. Carlos MacDonald.

It is well known that there are a great variety of nervous symptoms associated with Bright's disease. Some of these are a direct consequence of the impaired renal function, while others are dependent upon the arterial degeneration which is especially associated with that form of Bright's disease called the contracted or cirrhotic kidney, and which is so common in that form of Bright's disease that it is a question whether the arterial or the renal disease is the primary lesion.

ENDARTERITIS.

The degeneration of the arteries associated with Bright's disease is variously called endarteritis, arterio-fibrosis and arterio-sclerosis, and it consists in a sclerosis or thickening of the connective tissue which is most marked in the intima, but is also found in the media and adventitia. Such degenerated arteries in the brain lead to the formation of miliary aneurisms which often rupture, causing cerebral hemorrhage or apoplexy, with its attendant coma and subsequent paralysis. In other cases the thickening of the intima leads to a gradual obliteration of the lumen of the artery, which obliteration is often completed by a blood clot being deposited on the altered intima, causing cerebral thrombosis, another form of apoplexy, which may very closely resemble clinically that due to cerebral hemorrhage.

*Read before the Albany County Medical Society April 17, 1895.

Cerebral hemorrhage and cerebral thrombosis are frequently found associated with Bright's disease, especially with that form of it known as interstitial nephritis. Bright's disease is present in about one-third of the cases of cerebral hemorrhage and in many cases of thrombosis.* The symptoms of these affections are too well known to need any description here.

In some cases of endarteritis there is no thrombus formation, but the lumen of the artery is much narrowed by the endarteritis. In such cases when from any cause there is a general narrowing of the arteries, as for instance from a vasomotor spasm, or when the brain is in a condition of anæmia from any cause, this partially occluded artery will be especially affected. The area of the cerebral tissue supplied by it will be in a condition of extreme anæmia, will be unable to perform its functions, and a temporary paralysis will result. The nature of this paralysis, whether it be a hemianopsia, a motor or sensory aphasia, or a paralysis of an arm or a leg, will depend upon the portion of the brain involved.

Cerebral hemorrhage, cerebral thrombosis and temporary local cerebral paralyzes are, then, the common results of the arterial degeneration associated with Bright's disease. They can hardly be regarded as nervous symptoms of Bright's disease, because they are due to the arterial degeneration and do not directly depend on the renal disease. All these symptoms are due to cerebral anæmia, either alone, as in the case of cerebral thrombosis and cerebral endarteritis, or combined with pressure, as in the case of cerebral hemorrhage. It is not improbable that the general cerebral anæmia of mild degree resulting from a general endarteritis may be one factor in the production of uræmic symptoms in cases of interstitial nephritis.

URÆMIA.

The other class of nervous symptoms associated with Bright's disease are also, as we shall presently see, probably due to anæmia of the brain, but the changes in the blood and in the blood vessels causing this form of cerebral anæmia

*Gowers' Diseases of the Nervous System 2d edit., Vol. 2, p. 388 and 424.

depend directly on the impaired functional activity of the kidneys. These "uræmic" symptoms, as they are called, have been directly associated with Bright's disease by all observers, from the time of Bright, himself, down to the present day. They are numerous and of varied character, and consist partly in symptoms of irritation and partly in symptoms of paralysis of the cerebral cortex, for it is doubtful if the other portions of the cerebro-spinal nervous system are concerned to any considerable extent in the uræmic manifestations. The following are the principal uræmic symptoms:

Neuralgia has been said to be the cry of a nerve for pure blood, and in cases of Bright's disease, where the blood is not only anæmic, but toxæmic as well, it is not strange that neuralgia should frequently occur. As a matter of fact, we do find in Bright's disease all varieties of sensory irritation, from an intense itching and burning of the skin, up to the most severe forms of neuralgia. These neuralgias not infrequently occur in the muscles, and then pass under the name of "rheumatic pains." Closely allied to the neuralgias are the headaches so commonly complained of in Bright's disease. These headaches are most commonly met with in the form of migraine, sometimes on one, sometimes on the other half of the head. Not infrequently the uræmic headache is in the form of an occipital pain, which comes on especially in the morning, when the patient first wakes up. Similar to the neuralgias are the symptoms of irritation in the nerves of special sense; the spots and glimmering lights before the eyes and the noises in the ears, which are so commonly seen and heard in Bright's disease. All the uræmic symptoms so far mentioned may be regarded as symptoms of irritation affecting the sensory organs, or more probably their cortical sensory centres. We also meet in Bright's disease with a condition of evident general cortical irritation. The patients are irritable, peevish and cross. They dread to meet their friends, or to do their work. They feel mentally weak and uncertain, and their smallest duties seem to be most formi-

dable ones. The highest form of irritation of the nervous system due to renal disease manifests itself in convulsions. The convulsions may be general, and resemble epileptic attacks very closely, except for their long duration, or they may be limited to one side of the body, and thus simulate a local lesion of the brain. At times a more or less continuous twitching of a few or of many muscles precedes a convulsion, or occurs quite independently of the latter.

So far we have considered only the signs of irritation of the nervous system, but paralyses may also occur, although they are not so common. These paralyses may be local, as for instance, a temporary paralysis of sight, the so-called "uræmic amaurosis," in which there is total blindness for a few hours, or a few days, which blindness is not dependent upon any physical change in the retina or the optic nerve, but usually, though not invariably, occurs when the excretion of urine is scanty, and passes away when the flow of urine becomes abundant. We have already learned that convulsions may be limited to one side of the body, similarly, in some cases of renal disease we meet with a hemiplegia, a paralysis limited to one side of the body, which resembles a hemiplegia due to cerebral hemorrhage or embolism, except that it is usually of a much more transitory nature. Sometimes such a hemiplegia comes on very suddenly, at other times more slowly. The most extreme degree of paralysis resulting from uræmia is coma, in which all the cerebral activities are abolished, the patient is completely unconscious, neither sees nor hears, nor makes any voluntary motion, and may remain in this coma for hours, or days, and finally die in it, or in more favorable cases, may recover from it and live for years afterwards. In uræmic coma the patient is usually restless and somewhat cyanotic, the temperature is usually increased but may be diminished, the respiration is rapid and often irregular, the pulse may be slow and irregular, but is usually weak, small and rapid, although just before the attack of coma (as well as before other uræmic attacks) the pulse is always of abnormally high tension — a condition which is of importance in the causation of œdema.

In addition to these nervous symptoms already described, it is probable that the nervous system plays an important part in the production of other symptoms of uræmia, for instance in vomiting, which, although in most cases due to the presence of carbonate of ammonia (derived from urea) in the stomach contents, is sometimes doubtless of cerebral origin. In the same way the dyspnœa, so frequently seen in Bright's disease, is often due to œdema of the lungs, or to the deficiency in hæmoglobin and red corpuscles of the anæmic blood, and in such cases is much increased by exertion, but often it is due to an altered nervous influence. This nervous dyspnœa may occur in paroxymal attacks resembling asthma, but is especially distinctive in the later stages of renal disease in the form of Cheyne-Stokes respiration, in which conditions of apnœa alternate with those of dyspnœa; the patient breathing at first very slowly, and then more and more rapidly until he breathes very rapidly, then slowing down again to an absolute standstill, and there is a long pause of many seconds in the respiration. In the very early stages of Bright's disease there are frequently long pauses in the respiration, without there being any typical Cheyne-Stokes respiration. One of the early symptoms is that at night the patient often stops breathing, and the wife or husband notices that the breathing is arrested for a long time, and then is resumed in the normal way again. This is a very important diagnostic sign of the disease. The Cheyne-Stokes respiration occurs at the termination of Bright's disease, and is a very unfavorable symptom. It usually gives warning of imminent death. Downs,* however, reports a case which walked into the hospital with a typical Cheyne-Stokes respiration, albumin and casts were found in the urine, the Cheyne-Stokes respiration continued night and day for six days, but finally became normal, and the patient made a complete recovery. Such cases have been described by other observers, but they are extremely rare.

Burning and itching of the skin, pains in the muscles, neuralgic pains, headache (both occipital and in the form of

*Medical News, Phila., 1890, Vol. 56, p. 589.

migraine), glimmering lights before the eyes, noises in the ears, extreme nervous irritability, muscular twitching, convulsions (both general and partial), local paralyses (especially in the form of uræmic amaurosis and hemiplegia), a complete paralysis of all the functions of the brain manifesting itself in coma, vomiting and dyspnœa (especially in the form of arrests of respiration and in the form of Cheyne-Stokes respiration), are the principal nervous symptoms dependent directly upon renal disease. Although it is possible to explain almost all of these symptoms by changes in the cerebral cortex, yet the burning and itching of the skin and the attacks of migraine, indicate that the vaso-motor nervous system is also involved. Transitory attacks of numbness and coldness of the extremities, which are of frequent occurrence in Bright's disease, but which were not mentioned above, also point to an implication of the vaso-motors. Indeed, cerebral anæmia, which, as we shall see later, is the probable immediate cause of the uræmic symptoms, may in certain cases itself result from a vaso-motor spasm, which may occur in Bright's disease perhaps as the result of toxic substances circulating in the blood.

Although the occurrence of these uræmic symptoms, and their dependence upon the renal disease is established beyond all doubt, yet the cause of them, and the link which connects these two conditions together, is still a matter of great obscurity. These symptoms usually make their appearance at a time when the excretion of urine is either very much diminished or totally suppressed, or where the solid constituents of the urine are very much diminished; but this is not always the case. Sometimes they occur when both the urine and urea are being excreted more abundantly than normal. The fact, however, that they usually occur when the excretion of urine is diminished, together with the fact that the kidneys are excretory organs and normally remove effete matter from the blood, has made it seem probable that the uræmic symptoms are due to the failure of the kidneys to excrete some poisonous substance from the blood, and this most plausible

view has been maintained from the earliest time that Bright's disease has been investigated.

It is not my intention to discuss, or even to mention, all the theories which have been brought forward to explain the uræmic symptoms since Christison first regarded them as due to an accumulation of urea in the blood, and Osborne considered them to be due to an arachnitis. This last theory was soon abandoned, because an arachnitis was not found at the autopsy of many cases of uræmia. The theory of Christison, that the uræmic symptoms were due to an excess of urea in the blood, not only gave the name "uræmia" to the group of symptoms, but exercised a great attraction on investigators even down to recent times; and perhaps, even yet, is the dominant theory in the popular medical mind, but it has been abundantly proved that this substance alone is not capable of producing the nervous manifestations. The blood of persons suffering from marked uræmia has been analysed, and very varying quantities of urea have been found in it. In three cases of uræmia reported by Bartels,* the amount of urea in the blood was accurately estimated. In one case the amount of urea was so small that its percentage could not be determined; in the second it was 0.01%, and in the last, 0.8%. Sometimes the amount of urea found is thus very small indeed; on the other hand the blood of persons is met with which is found, by analysis, to contain a very much greater quantity of urea, yet these persons remain entirely free from uræmic manifestations. Moreover, when in animals from whom the kidneys have been extirpated, so that the urea cannot be excreted by them, urea is injected in large quantities, the great majority of experimenters can produce neither convulsions, nor any other uræmic symptoms.

In consequence of the inability to explain the symptoms by the urea in the blood, Frerichs originated the theory that the uræmic manifestations were due to carbonate of ammonia which was found in the blood of certain uræmic persons, and which he considered was produced in the blood by the decom-

*Ziemssens' Cyclopedia, Eng. Trans., Vol. XV., p. 139.

position of the urea when acted upon by some special ferment. It was found, by experiment, that carbonate of ammonia injected into the blood-vessels produced symptoms very similar to the epileptiform convulsions and coma of Bright's disease,* but it was not long before it was discovered that in many cases of uræmic convulsions and other uræmic manifestations in patients, and in experimental uræmia in animals, no carbonate of ammonia could be found in the blood (even when tested by methods so delicate that 0.0001% of carbonate of ammonia can be detected, if present), nor could it be detected in the breath of these patients, nor was there any evidence that the symptoms were due to this substance.

After the urea and the carbonate of ammonia theories were both proved to be untenable, the attempt was made to explain the uraemic symptoms by the presence of extractive matters; the salts of potash by some observers; creatin and creatinin by others, and by still other observers, some unknown toxic substance which is normally eliminated by the kidneys. But experiments have not shown that the injection of any of these substances, except carbonate of ammonia, into the blood, is able to produce symptoms identical with those of uraemia (although some of them will do so when applied directly to the cerebral cortex); nor have these substances been found, by analysis, in the blood of persons suffering from uraemia.

Finally, all the theories which regard the uraemic symptoms as being due to the presence in the blood of any substance which should be eliminated by the kidneys, are controverted by the fact that the extirpation of both kidneys in animals causes no symptoms which resemble those of uraemia. Furthermore, in the case of men where, in consequence of intense congestion,* or in consequence of obliteration of both ureters by calculi or tumors,† the excretion of urine from the body has been either absolutely, or almost

*Rosenstein Virchow; Archiv Bd, 55.

*Dickinson on Renal and Urinary Affections, part 2, p. 311. Bates' Medical Record, October 16, 1880, p. 431.

†Dickinson on Renal and Urinary Affections, part 3, p. 951.

Owen Rees, on the nature and treatment of diseases of the kidney connected with albuminous urine. London, 1850.

absolutely, stopped; the patients live for ten or twelve days, present no uraemic symptoms, are perfectly conscious, have full possession of their intelligence almost up to the moment of death, and die usually in consequence of cardiac weakness. In a few of these cases convulsions occur before death, but that is not the rule, and in those cases where there are no uraemic symptoms there is no œdema. Such cases as these can hardly be reconciled with the theory that the uraemic symptoms are due to the presence of any substance which should normally be excreted from the urine. In such cases as these described, although the urea is excreted very largely by the mucous membrane of the alimentary canal, yet the amount of urea in the blood is very much greater than is ever found in Bright's disease.

If it is difficult to explain the general symptoms of uraemia by the hypothesis of any poison not excreted by the kidneys, but circulating in the blood, it is very much more difficult to explain in this way the hemiplegias, the unilateral convulsions, the uraemic amaurosis, and the other symptoms which occur in uraemia. A poison would effect the entire brain, and not small areas of it alone. In autopsies in cases of local uraemic symptoms, the lesion most commonly found is cerebral œdema. Thus Jäckel* reports four cases of hemiplegia in the course of chronic Bright's disease, with nothing to explain it at the autopsy except cerebral œdema. In the service of Carpentier† the case of a man, thirty-five years old, suffering from acute nephritis from cold is reported, who, twenty-four hours before death, after two convulsions, had a left-sided hemiplegia. At the autopsy an extreme degree of œdema of the right hemisphere was found, while the left was almost free from it. There was also found interstitial nephritis. Paetsch‡ reports two cases of hemiplegia with contracted kidney in which œdema of the brain was found at the autopsy, and Eichhorst§ reports two cases of hemiplegia

*Beitrage zur symptom-complex der uræmie, insbesondere ueber uræmische læhmungen dissertation. Berlin, 1884.

†Presse Med. belge, No. 9, 1879.

‡Paetsch. Zeitschrift f. Klin. Med. Bd. 3, S. 209.

§Eichhorst. Handbuch der speciellen pathologie und therapie 4th edit. Vol. 2, p. 586.

at the the autopsy of which a slight œdema and anaemia of the brain was found.

That œdema of the brain will cause convulsions and paralysis we know from the cases of thrombosis of the cerebral sinuses in which the consequent œdema causes the convulsions and hemiplegias, or paraplegias, according as the œdema is more or less widespread. There is no way in which the local uraemic manifestations can be as well explained as on the supposition of local œdema. Thus, if a patient lies on one side, the lower cerebral hemisphere may alone become œdematous, and unilateral convulsions, or hemiplegia, may result. If a patient lies on his back, he may well have an œdema only of the occipital lobes—the cortical centres for sight—and thus may result a temporary blindness with persistence of the reaction of the pupils to light, which shows that the lesion is neither in the retina, nor in the optic nerve, nor in the corpora quadrigemina, but above these points, because the reflex arc for the pupil is not involved, which is characteristic of uraemic amaurosis.* The theory of a vaso-motor spasm would not explain the facts as well. An œdema would naturally occur in both occipital lobes at the same time, and blindness of the whole field of vision would result. A vaso-motor spasm would be more likely to occur on one side of the brain only, or at least would sometimes occur on one side alone, and a hemianopsia would result, but I believe that in the whole field of medical literature there is no record of a hemianopsia occurring as a uraemic symptom. Therefore, I am heartily in accord, as far at least as the local uraemic symptoms are concerned, with the theory of Traube, which explains the uraemic symptom as resulting from cerebral œdema. Inasmuch as œdema is one of the commonest symptoms of Bright's disease, it is not strange that it should occur in the brain and should be the cause of the uraemic symptoms. When the urine is suddenly totally suppressed, it is rare to find œdema of any part of the body and there are no uraemic symptoms. The cause of the œdema in Bright's disease is

*Ebert and Hennoch, Berl. Klin. Wochenschrift, 1868. E. Schmidt, Beri. Klin. Wochenschrift, 1870, p. 575. Rosenstein, Pathologie und Therapie der Nierenkrankheiten, 1894, p. 226.

obscure and not yet settled beyond dispute, but does not concern us here.

If we consider the general manifestations of uræmia, we will find that there is considerable evidence to regard them also as caused by cerebral œdema. Dickinson* states that post-mortem examinations of brains of cases of uræmia, especially in adults, show them to be pale and watery. Budde† in twenty-five cases of uræmia in the Communal Hospital, in Copenhagen, states that there was œdema and anæmia of the brain in eighteen; there was a collection of fluid in the ventricles and sub-arachnoid space in four. There was anæmia alone in two, and in one only was the brain normal. Person and Carpentier‡ report five cases of chronic nephritis with uræmic symptoms, and in all five cases there was well marked œdema of the brain found at the autopsy. It may be mentioned here that the recognition of cerebral œdema post-mortem is not always easy. It has been stated that the œdema of the brain may be the result and not the cause of the uræmic convulsions, but Traube has reported a case of uræmic coma without convulsions, in which cerebral œdema was found, and Rosenstein§ has proved by experiments on animals that convulsions lasting for hours do not cause cerebral œdema. Œdema of the brain, by compressing the blood vessels, and by interposing a layer of fluid between the capillaries and the brain tissue, causes an extreme anæmia of the brain. It is probable, therefore, that even in cases of cerebral œdema, cerebral anæmia is the real cause of the uræmic symptoms. Rosenstein* states that in many cases of uræmia the convolutions of the brain are flattened, and the whole brain is strikingly anæmic. He regards the anæmia of the brain as the cause of the uræmic symptoms, whether the anæmia is due to an œdema or to some toxic element in the blood which causes a contraction of the vaso-motors. As a final result of

*Dickinson on Renal and Urinary Affections, p. 2274.

†On Uræmian Med. sarligt Hensyn til dens Pathologenes og Therapie. Ugeskr. F. Læger R. 3.

‡Presse Med. Belge. No. 8-16, 1879.

§Rosenstein. Epilepsy Saturnia, Virchow's Archiv. Bd., 39.

*Pathologie und Therapie der Nierkrankheiten, 1894, p. 283-285.

my study of the pathology of uraemia, I believe that the uraemic symptoms are due to cerebral anaemia, which is, itself, caused in the great majority of cases, if not invariably, by cerebral oedema, and that the symptoms are general or local, according as the oedema is general or local.

The *diagnosis* of uraemia can only be made with certainty by an examination of the urine, and by finding in it albumin and casts. In a doubtful case it may be necessary to draw the urine with a catheter, in order to establish the diagnosis. If coma is associated with a rapid pulse and respiration, cyanosis and oedema of some part of the body, or if convulsions are very long continued and are followed by a very deep coma, or if hemiplegia or amaurosis is of short duration, and in the course of a few hours or days disappears completely, or if neuralgia is associated with a swollen, waxy complexion and with dyspnoea on exertion, it may well be suspected that these symptoms are uraemic. But even in such a case, that diagnosis cannot be regarded as certain until the urine has been examined, and casts and albumin have been found in it. The peculiarities mentioned above can only be considered as furnishing corroborative evidence of the diagnosis. Very rarely cases are met with in which hysteria or epilepsy is combined with Bright's disease. In such cases it may be extremely difficult, or even impossible, to say whether the convulsion or the coma is uraemic, or hysterical or epileptic.

The *treatment* of uraemia will depend upon our belief in regard to its pathology. Believing, as I do, that cerebral oedema is the most common cause of uraemic manifestations, the treatment should be directed to the relief of this oedema. For this purpose the head should be elevated slightly, so that we may have the advantage of position in relieving the oedema, which we find so effective in oedema of other portions of the body; although by this posture the anaemia of the brain is temporarily increased. The next thing to do is to reduce the watery condition of the blood, which makes the transudation easier through the blood-vessels. To do this we eliminate as much water from the sys-

tem as possible, thus preventing the free transudation through the blood-vessels and causing the absorption of the fluid already outside of the blood-vessels. We can cause the elimination of water from the system by means of the kidneys, by giving diuretics, but in doing this we are apt to cause an increased excretion of albumin, which tends to make the blood hydræmic. It seems, therefore, wiser, if possible, to secure a free elimination of water from the intestinal tract and from the skin, and to do this we give the patient a brisk purge and hot air baths or hot water baths. Pilocarpine also causes free diaphoresis, but it is, in my experience, a dangerous drug to use when the patient is comatose and the system consequently in a depressed condition. Another essential thing in the treatment is to reduce the excitability of the nerve cells, so that they will be less sensitive to the œdema. We can lessen the excitability of the cerebral cells by the inhalation of ether or chloroform, but more especially, by giving morphine or chloral, and it is surprising how well, in a great many cases of uræmia, these drugs act in relieving the immediate symptoms. In view of the high arterial tension which invariably precedes a uraemic attack, it does not seem wise to give digitalis in uraemia. Nitro-glycerine would seem rather to be indicated.

Elevation of the head, chloral or hypodermatic injections of morphine in severe cases, promoting abundant sweating by means of the hot air, hot water or steam baths, and a free catharsis are the principal points in the therapeutics of uraemia. After the uraemic symptoms have subsided, of course the original disease, the Bright's disease, must be treated by methods outlined already before the society, in the description of the different forms of nephritis.

THE Albany Medical Annals

JOURNAL OF THE

Alumni Association of the Albany Medical College.

HOWARD VAN RENSSELAER, PH. B., M. D., EDITOR.

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No. 5.

ANNOTATIONS.

Tannigen.—Although our modern *materia medica* is abundantly supplied with astringents, both of mineral and vegetable character, there has long been a need for an astringent which, when administered by mouth, would exert its effect upon the lower end of the intestinal tract. Tannic acid and the preparations containing it have been largely used for their astringent effect upon the intestinal canal, but they have the great disadvantage of irritating the stomach and disturbing the digestion and appetite, especially when administered for long periods of time as is so frequently necessary. The desideratum has been to secure a preparation which would be unaffected in the mouth, devoid of disagreeable taste, and pass unchanged through the stomach, so that its full astringent influence would be exerted on the intestinal mucous membrane. After prolonged experimentation, Prof. Meyer, of the University of Marburg, succeeded in constructing an acetyl derivative of tannic acid which seems to be possessed of all the requirements of an effective non-irritating and non-poisonous astringent. To this compound the name of Tannigen has been applied. It appears in the form of an odorless and tasteless powder, which is insoluble in water and acid solutions, but readily soluble in acid fluids containing borax, carbonate of soda, and other

alkalies. Owing to its insolubility in acid fluids it is unaffected in the stomach, exerting no effect upon the digestion and appetite. Experiments on animals have shown that small quantities of it could be discovered in the feces. Prof. F. Muller, who at the suggestion of Meyer, made an extensive use of this remedy, both in private and hospital practice, expresses himself very favorably regarding its value. He found it of special benefit in cases of chronic diarrhoeal troubles, especially the diarrhoea of phthisis, in which it very promptly afforded relief of this distressing and debilitating complication. As he observed that tannigen was perfectly innocuous he administered it in knife pointful doses, four or five times daily, in his dispensary practice. It also proved of service in chronic dysentery. Muller's results are so very favorable as to warrant a thorough and extended trial of tannigen in general practice.

An Old but Flourishing Blunder in Medical Chemistry.—Folkard, in the *American Journal of Pharmacy* for November, 1894, uses this title for an article, in the course of which he says: "Lithicurate (the urates) hence lithia water is occasionally prescribed to gouty patients, and to others who suffer from a superabundance of uric acid."

The above is an extract from p. 773, Part III., of Miller's "Elements of Chemistry," fourth edition, published in 1869, and there is sufficient semblance of truth in it to mislead those who are able to devote but few months to the study of chemistry, as is the case with the majority of medical students.

Although the paragraph quoted was omitted in the new edition published in 1880, it would seem that no attention was called to the subject, for sufferers from too abundant secretion of uric acid have been treated up to the present time on an erroneous assumption, proceeding from the "little knowledge" which is so admittedly so dangerous, and which is also, doubtless, responsible for the practice of exhibiting chlorate of potassium in cases of blood-poisoning, to "oxidize and destroy the poison in the blood," whereas every chemist

is aware that in an alkaline like the blood the chlorate of potassium is practically as stable and inert as the chloride, or as common salt.

In these remarks the writer disclaims the idea of censuring the members of the medical profession, because these are chemical subjects, and if blame be due anywhere, it must, undoubted, fall upon chemists, for neglecting to point out to members of an allied profession the absurdities involved in these two cases.

There is, however, one great consolation for the uric acid and pyæmic patients who have been so wrongly treated, viz., that both lithia water and chlorate of potassium are (as far as we know) harmless,—quite unlike the copious blood-letting and salivation treatments of a bygone age.

At the same time, it must be remembered, that the use of valueless “remedies,” however harmless in themselves, hinders, or altogether prevents the search for real and rational ones. The sooner, therefore, attention is drawn to them the better for the patients, even should there be nothing to propose in lieu of those discarded.

Although the absurdity of the lithia water “bull” merely requires to be mentioned to a trained chemist to be at once recognized, it may be as well to give a few details.

In the first place, substitution of lithium for sodium in the animal economy would probably be by no means an unimportant change. Physiologists have found that the substitution of the blood of one animal for that of another is possible in the case of allied species, but in that of animals belonging to different genera the change may be followed by immediate death. In all probability, therefore, it would be a very risky proceeding to convert the albuminate of sodium in human blood into albuminate of lithium, even if it were possible. Fortunately for the patient, however, this is as likely to be successful as the notion regarding the medicinal use of free phosphorus, viz., “The brain contains free phosphorus, and the more brain work the more of that element is excreted. Therefore, to restore brain waste, give phosphorus pills.”

Such a crudity as this would be scouted, even as regards the animal kingdom,—e. g., in the simple, or comparatively simple, operations of metallurgy.

In the second place, the question of quantity may be considered. As a bottle of lithia water contains about five grains of lithia, it is chemically equivalent to about ten grains of sodium.

The quantity of blood in an adult being about 100,000 grains, and containing about 294 grains of chlorate of sodium, equivalent to about 156 grains of sodium, it would evidently require fifteen or sixteen bottles of lithia water to replace the sodium by lithia, supposing that sodium salts were absent from the food.

From the quantity and composition of the urine, however, we know that about 140 grains of common salt, equivalent to about 75 grains of sodium, are excreted every twenty-four hours, derived, of course from the food. It follows, therefore, that from seven to eight bottles of lithia water would be required every day for the sole purpose of dealing with the sodium salts introduced in the food.

These results are conclusive as to the value of the present practice.

To the chemist, however, the above figures are superfluous. He knows that the tendency is towards the formation of the more insoluble, not of the more soluble, compounds; and that for lithia to be of any service in avoiding decomposition of urates in the joints or bladder, all bases which form compounds with uric acid of less solubility than lithic urate (potassium, sodium, ammonium) must be absent.

If we have a solution containing a phosphate, a magnesium salt and free ammonium, we know that in a longer or shorter time a precipitate of ammonio-magnesian phosphate will take place, and the only way to prevent it is to insure the absence of one of the constituents of the precipitate. We cannot argue that "phosphate of potassium is more soluble than ammonio-magnesian phosphate, so adding a salt of potassium to the solution we shall prevent the formation of the very

sparingly soluble magnesium compound," and yet that is the assumption with regard to the medicinal use of lithia water.

It is a chemical exemplification of the truth of the old proverb about one man being able to lead a horse to water, etc. It would be extremely convenient as regards uric acid patients if lithia water could be made to act in this way, but the laws of chemical combination do not admit of it. The medical profession, therefore, must recognize the fact, and seek elsewhere for a remedy or palliative for their patients.

An analogous case occurred in the gas world, where gas engineers strove for many years to purify the gas from bisulphide of carbon vapor by means of sulphide of calcium, and at the same time endeavored to make the spent lime inoderous by converting it into carbonate before taking it out of the purifier. Here, again, it would have been very convenient if carbonate of calcium could have been induced to combine with carbon bisulphide, but it is hardly necessary to remark that the attempt was a failure.

Although it is a matter for regret that the science of therapeutics should be in such an elementary stage in the nineteenth century, still, the physician is but in the same predicament as the chemist whose work lies in the vegetable and animal kingdoms. Take, for example, the apparently simple question of water analysis. The intellect of the civilized world for fifty years or more has been unable to devise a process (physical, chemical, microscopical, or biological) which will enable the operator to say with certainty, "This water is wholesome." There are several processes which are capable of detecting bad water, but in many cases this can be done by the senses alone, and so recourse must be had to indirect methods, such as ascertaining the mortality and sickness among the people who use the water, or examining the source as to the probabilities of pollution. Little wonder, then, that medical science is frequently baffled in the attempt to deal with the complex problems of human pathology. Mineral analysis is but child's play compared with the study of morbid actions taking place in closed vessels, suspended in

another closed vessel, the walls of all of them being opaque.—*The Therapeutic Gazette*.

Cold Bathing During Menstruation.—Cold bathing during menstruation is a beneficial measure, provided women accustom themselves to the treatment by bathing every day for at least eight days before the arrival of the period, when they can continue during the menstrual flow without any danger. In the case of a very anæmic girl, in whom this treatment was instituted, it gave most satisfactory results. Housel, before the recent Boulogne Congress, held that cold salt water baths facilitates the menstrual flow, increase the duration of genital life, and likewise increase fecundity in a remarkable manner.—Dr. Dedasse, in *Gazette de Gynecologie*.

Photographing the Womb.—A Swiss physician has described a method of dilating the uterus by means of tents, so that by the use of a mirror a perfect view may be obtained of the interior of the organ. Not content with this, however, he is unselfish enough to desire to obtain photographs of the uterine interior in various diseases of the organ. The future of women is sad, indeed, if now her womb must not only be felt of, sounded and measured, but photographed as well.—*New York Polyclinic*.

The Decline of the Pessary.—The *Lancet Critic* says, editorially: "No one invents a pessary nowadays, in strange contrast to the time when scarcely a man prominent in the practice of diseases of women who did not invent one." One may conclude from this that either all available pessary devices have been invented, or that the use of the pessary is to be discouraged. It is the latter view that Dr. J. G. Blake holds, in a communication of the Obstetrical Society of Boston, April, 1894; his alternative for the pessary is, of course, surgical procedure. His complaint is more of the abuse, than the use of the pessary, although he quotes Fritch, a German writer, who declared that he had spent ten years in learning the treatment by pessaries, and considered it the most difficult in the whole range of gynecology, and that it is easier to

perform a laparotomy than to apply an accurately fitting pessary.

The same author criticises their use, declaring that the pessary heals palliatively, but injures definitively, for it distends the fornix vagina so enormously, that even after it has been worn for years, a cure is not to be hoped for. On the contrary, retroflexion of the uterus returns after the removal of the pessary. The longer the uterus has been displaced, the longer the time necessary to enable the reflexed ligaments to return to a normal condition; and a few days have been sufficient, after its withdrawal, to have the uterus fall back into its old position.

Among the means for obtaining permanent cures, Blake mentions narrowing the vagina; pregnancy, following by prolonged rest in bed; dilating and curetting, and shortening the round ligaments. The first, he says, is only called for in complete prolapse, where no instrument, without external support, will keep the uterus within the vagina, but where it can be accomplished by narrowing the canal and the outlet; these cases are comparatively rare. The operation of dilating, curetting and packing is particularly adapted to the cure of antelexions, and to the removal of enlargements which attend all forms of backward displacement. The combined dilating, curetting and Alexander, is, to his mind, the true solution, up to date, of the vexed problem of backward displacements.

Ventral fixation, by opening the abdomen, and by various other methods (the vaginal, for instance) of fastening the uterus, had been advocated by many writers. He sees no advantage in them over the simple, harmless and in most cases effective operation in proper cases, and of dispensing with pessaries.

He thinks no one has yet devised a simpler, less dangerous or more effective measure for the emancipation of women from the wearing of pessaries than the two operations of dilating and curetting, and Alexander.—*Western Med. Reporter*.

REVIEWS AND BOOK NOTICES.

The Principles of Bacteriology.—A Practical Manual for Students and Physicians, by A. C. ABBOTT, M. D., First Assistant, Laboratory of Hygiene, University of Pennsylvania, Philadelphia. Second Edition, Enlarged and Thoroughly Revised. With 74 Illustrations, of which 17 are Colored. Philadelphia: Lea Brothers & Co. 1894.

Bacteriological investigations are making such rapid strides that it keeps one perpetually on the *qui vive* to be abreast of the current literature of this specialty; and any work which goes into the finer intricacies of the subject, or which gives the most recent knowledge at the time of publication, or which discusses muted points, must, by the tremendous array of new information that is constantly accumulating, soon become old and find its usefulness at an end.

A book, on the other hand, which is written for beginners, and which deals with well known facts, and guides the student along the standard methods of investigation and technique, and which describes the best known and most important forms of bacteria only, is, from the very nature of the thing bound to live longer and have its usefulness last for a considerable time.

To the latter class of works belongs Abbott's Bacteriology. It presupposes that the reader is unfamiliar with bacteriology, and the author has as he has explained in this book "restricted himself to those fundamental features that are essential to its understanding."

The author has presented his subject clearly, succinctly, and scientifically, and has covered much more ground than his modest statement would lead one to suppose.

It is a book well adapted not only to the beginner but also to those more advanced in bacteriology. The illustrations are numerous and good and the entire plan of the work is to be recommended.

Lea Brothers & Co.—Works in Press.

Hayen & Hare's Physical and Natural Therapeutics.—Ready Shortly. Physical and Natural Therapeutics. The Remedial Use of Heat, Electricity, Modifications of Atmospheric Pressure, Climates and Mineral Waters. By GEORGES HAYEN, M. D., Professor of Clinical Medicine in the Faculty of Medicine of Paris. Edited with the assent of the Author by HOBART AMORY HARE, M. D., Professor of Therapeutics in the Jefferson Medical College of Philadelphia. In one handsome octavo volume with numerous illustrations.

Non-medical remedies have always been recognized as among the most potent agencies at the command of the physician, but recent years have witnessed a tendency to concentrate research upon the uses of drugs. Physical remedies, on the other hand, will always retain certain elements of marked advantage, and the purpose of this volume is to impart a knowledge of them in every way as modern, as clear and as definite as that available concerning any other class of therapeutical agents. The author and editor are preeminently fitted to express authoritative and judicial views concerning both medicinal and non-medicinal remedies, and this volume will be accordingly welcomed by the large medical public desiring the most trustworthy and practical information regarding the prescription of climate, mineral waters, heat, cold, electricity, baths, massage, compressed and rarefied air, etc. Due attention will be devoted to American health resorts, an element of national wealth none the less valuable because hitherto largely overlooked. The article on Medical Electricity has been brought into thorough conformity with the American development of this subject, including the admirable forms of apparatus easily attainable. The work is illustrated wherever necessary, and is assured of acceptance as the authority in its most important branch of medical practice.

Herrick's Diagnosis.—Preparing.—A Handbook of Diagnosis. By JAMES B. HERRICK, M. D., Adjunct Professor of Medicine, Rush Medical College, Chicago. In one 12mo. volume of about 400 pages.

LEA BROTHERS & Co., Publishers, 706, 708 and 710 Sanson Street, Philadelphia.

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\$1.00 A YEAR.

Association of the Alumni of the Albany Medical College.

TWENTY-SECOND ANNUAL MEETING.

The twenty-second annual meeting of the Association of the Alumni of the Albany Medical College, was held in Alumni Hall on Tuesday, April 16, 1895. The usual informal reception was held in the library, where coffee and sandwiches were served, photographs exhibited and greetings exchanged, between the hours of 9 and 11 A. M. The meeting was called to order by the president, Dr. Adam T. Van Vranken, ('73) of West Troy, N. Y., at half past ten o'clock.

The following members of the Association, with invited guests, students of the college and others interested were present: W. H. Snyder, ('39); W. H. Woodruff, ('54); A. Ennis, ('55); R. V. K. Montfort, ('56); E. B. Boyce, ('58); M. Felter, ('59); A. Vander Veer, ('62); H. Bendell, ('63); L. Hale, ('68); J. M. Bigelow, D. C. Case, W. G. Tucker, ('70); J. B. Stonehouse, ('71); D. H. Cook, C. K. Frazier, A. T. Van Vranken, ('73); H. E. Mereness, ('74); E. D. Fuller, G. P. K. Pomeroy, ('78); E. A. Bartlett, W. J. Nellis, P. L. Suits, ('79); C. B. Herrick, G. S. Munson, ('80); F. L. Classen, C. H. Crawford, H. L. Furbeck, L. T. Vedder, ('81); F. A. Palmer, H. R. Powell, T. F. C. Van Allen, J. B. Washburne, ('82); J. F. Reilly, Theobald Smith, ('83); L. B. Rulison, ('84); S. C. Curran, A. L. Johnson, ('85); J. H. Bissell, W. G. MacDonald, A. MacFarlane, C. H. Moore, H. V. Mynderse, ('87); J. Archibold, G. E. Lochner, ('88); A. H. Bayard, W. G. Murphy, Wm. Van Doren, ('89); J. W. Kniskern, A. G.

Root, ('90); W. H. Conley, S. Le Fevre, ('91); G. M. Fisher, W. I. Goewey, R. A. Heenan, W. G. Lewi, L. H. Neuman, C. F. Theisen, ('92); E. J. Bedell, E. M. Leach, J. B. Ledlie, T. A. Ryan, L. G. Tuttle, ('93); C. H. Cole, W. C. Gilday, W. S. Hale, J. R. McElroy, J. M. Moore, R. Sheldon, W. J. Woodruff, ('94); E. V. Baldwin, W. S. Bristol, T. M. Clarke, F. W. Cordes, C. Gartner, S. A. Haggerty, D. W. Hardy, F. H. Hurst, F. G. Hyde, A. M. Johnson, E. S. Kinloch, H. W. Murphy, C. L. Myers, S. Pashley, E. F. Pickford, W. K. Quackenbush, W. M. Rapp, F. J. Resseguie, A. T. Robinson, F. Sauerbrie, R. A. Sauter, D. J. Shay, L. G. Stanley, H. N. Tanner, C. R. Townsend, C. H. Turner, C. E. Weidman, J. A. Wilder, ('95); L. Balch, F. C. Curtis, H. Hun, (hon.)

The president introduced Professor John M. Bigelow, M. D., ('70), who delivered the following address of welcome to the alumni on behalf of the college faculty:

ADDRESS OF WELCOME.

Mr. President and Fellow Alumni:

In behalf of the faculty of the Albany Medical College it gives me great pleasure to welcome you on this annual re-union of your Association, and especially to congratulate you as to its rapid growth and prosperity. Few in number at the beginning of your fraternity, you have, year by year, added to your membership; so that this day, registering the commemoration of the twenty-first year of your incorporation, shows a record of a majority of the graduates, as well as announces the fact that you are of age; that you are entering on a new epoch. Birth days are generally celebrated by festivities, by mutual interchange of good wishes with friends, and by offerings, suitable, as a remembrance of the occasion. We know that this natal day will not be an exception, and in the participation in the exercises appointed, we again have an opportunity for mutual greetings, for the rehearsal of the gladsome "times" of by-gone years, for the comparison of experiences, for the renewal of our youth in bringing back to our memory "the days of yore;" as Virgil says: "haec olim meminisse juvabit; durate, et rebus vosmet servate secundis." Your presence also will greatly cheer up and encourage those who come after you to wait for and enjoy the festal day.

Your members, already, are filling positions of influence and power, not only in our profession, but as well in places of social, educational and political preferment. The strength of any educational institution, its rank and command over the people, to a great extent, lives in the loyalty and affection of its graduates. The large attendance at these meetings is a pledge of their unceasing affection to the college, and is very grateful to the faculty. The acquisition of technical knowledge, and even its use day by day, does not create success so much as the enthusiasms we have acquired. "The student who feels that at the end of disciplinary work he has nothing more to do with

any of the studies he has pursued," and hopes and trusts in experience and practice to win the hand of Fortune, is never likely to reach the highest attainments nor the highest successes. We grow by our enthusiasms. They must be genuine and persistent; not vacillating and ephemeral. These reunions are camp-fires that enkindle any waning love for our *alma mater*, and bring us into close comradeship with each other and with those who are in touch with the best thought and foremost advances of medical science. Theology, medicine, law are called the learned professions; their disciples have been held in reverence from the earliest days of the Christian era; they were the repositories of learning and scholarly attainment; they have been, as is well said by a prominent educator: "the bone and sinew, the flesh and blood, the most potent agencies in giving freshness and virility to the world's thought:" to-day, the great questions, of the Divinity of Christ and perpetuity of His word; of the Cosmopolitan monetary adjustment of currency, and of the relationship of labor to capital; of the ætiology of diseases and of the remedies for their prevention, alleviation or cure, are challenging the best efforts and most earnest thought, not only of the members of the respective professions, but also of the thinkers and philosophers of our age. "But no matter what his point of vision, no matter what has been his training, no matter how much he may be involved in the world's commercial life and industrial undertakings, no man can safely say that these learned and powerful professions which first made and have always shaped and strengthened universities, and I may add colleges, will not continue to be mighty powers in shaping their organization and directing and energizing their work, if they are to continue as they are, to stir up, to originate, to vitalize, to train and to elevate the world's opinions." Such is the testimony of one who has devoted his best years to the methods and work of educational institutions.

What a fundamental change has taken place in medicine and surgery within the last twenty-five years!—the result of special and unremitting investigation.

The microscope has given to us the science of bacteriology and has revolutionized all of our theories of disease. We now can find out not only the result of disarranged function or of an infected organ, but also can ferret out the causes of many of these inflictions on the human body; we can so accurately define them that the characteristic bacillus or microbe, with its poison-bearing environment can be easily recognized and named; its personalty can be described and its photograph placed in the gallery of the pathological laboratory, and be identified when discovered. It will not be long before medical science will ascertain, as accurately, some universal law in Therapeutics, by which these pestiferous germs may be destroyed; then we may reach the age of the biblical patriarch and live out the primal period of human life.

"The greater the revelations of science, the more imperative the demands for thorough and comprehensive technical knowledge. But with this comprehensive knowledge should be associated a fervent intellectual spirit which keeps abreast with the latest revelations of science, and makes all knowledge the helpful handmaid of our noble profession." (Dr. Adams) During the last year the faculty of this medical college has endeavored to furnish the student with more and improved clinical advantages, so that the daily experience of

the practitioner in medicine could be partially learned before graduation. It is our purpose not only to present the most advanced technical knowledge of our art, but also by bedside clinics, by individual operations on, by personal examinations of, the various cases presented at the numerous medical institutions of this city, to prepare each graduate for a successful entrance into his great life work.

We have also assigned to each senior, cases in the several departments to examine, to diagnose, to prescribe for, to perform an operation. Such instruction can not fail to furnish the future "young doctor" not only with a knowledge of books and of the individual opinions of his teachers, but also bestows upon him experience and practice in the art of our profession.

And now, as the present senior class will soon be knocking at your door for admission to this Association, let me remind them that this is not the time to indulge in ambitions, visionary and housed in air-castles, but to recollect that their future is dedicated to a *vocation*, which will demand the most persistent application and ready command of resource, at all times. The man who makes the most of himself, does the best he can for himself and for the world; *what* a man shall do and *how* he shall do it, is primarily a question to be settled between himself and his Maker. Having found his calling, he should aim high, striving for the *best* for *himself* and for his *neighbor*; not constantly and servilely keeping his eyes on society and the effect of his activities on others, but live up to the precept that "Whatsoever ye do, do it heartily as to the Lord and not to men." Recollect that you will soon be enrolled as members of an ancient and most noble profession. Enlisted in its ranks have been, and are, great-hearted and wise men, whose names and achievements in the medical profession have won not only fame and fortune, but also have been a benison to the human race. Such associates should remind us all of the dignity, of the responsibility and of the power of the title of M. D.,—Doctor in Medicine.

Gentlemen of the Alumni, allow me again to greet you, and with the clasped hand to congratulate you on your prosperity and success; and furthermore to hope that the future may bring to *you* and to *us* the reward of "Well done, good and faithful servant."

On motion of Dr. W. H. Woodruff, the thanks of the Association were tendered to Dr. Bigelow for his interesting address.

On motion of Dr. J. B. Washburne, the reading of the minutes of the last annual meeting was dispensed with, and the minutes as printed adopted.

Dr. Mereness moved that the Chair appoint a committee of five to nominate officers for the ensuing year. Carried. The president appointed as such committee, Drs. H. E. Mereness, ('74); J. B. Stonehouse, ('71); C. K. Frazier, ('73); J. B. Washburne, ('82), and W. J. Woodruff, ('94). The committee retired.

The report of the executive committee and recording secretary was then presented. It stated that two meetings had been held during the year. At the meeting held May 9, 1894, the recording

secretary read a letter received by him from Dr. Charles Hutchinson of Portland, Maine, who had been elected president of the Association at the annual meeting, resigning the office. The letter concluded as follows: "My plans for next year are such that I am very unlikely to be with you. I fully appreciate the honor conferred upon me and regret that I cannot accept the position." It appearing from Article VII of the constitution to be the duty of the committee to fill the vacancy, and the resignation of Dr. Hutchinson having been accepted, Dr. Adam T. Van Vranken, ('73), of West Troy, N. Y., was, by a unanimous vote, chosen to fill the vacancy. At the same meeting the printing of the Alumni proceedings in the Albany Medical Annals for May and their reprinting in pamphlet form was authorized, and 1,300 copies were subsequently printed and distributed to the members of the association. The recording secretary presented a statement of the Alumni dinner account, from which it appeared that the receipts from tickets sold had been \$158.50, and disbursements as follows: For the Alumni dinner and cigars, \$237.50 (exclusive of printing, etc.); leaving a deficiency of \$79.00, which had been paid by the faculty of the college, as was also the postage upon the Alumni proceedings. At the meeting held February 25, 1895, the distribution of the proceedings was reported. A copy had been sent to each of the Alumni, together with a college catalogue and treasurer's blank. The order of exercises for the annual meeting was discussed and the following committees were appointed, Arrangements for meeting, Drs. Van Vranken, Tucker, Culver and Bartlett; lunch and dinner, Drs. Tucker, Nellis and Bendell; speakers and toasts, Drs. Vander Veer, Mereness and Bendell; reception, Drs. Cook, Babcock, Dwyer, Stonehouse, Allen, Van-Allen, MacFarlane, La Hann and Sabin. On motion, the faculty of the college were invited to participate in the exercises of Alumni day and to appoint some representative to deliver an address of welcome to the Alumni at the opening of the annual meeting. Dr. Theobald Smith, ('83), bacteriologist of the Bureau of Animal Industry, Washington, D. C., was, on motion, invited to deliver an address upon some scientific subject at the close of the annual meeting. The historian reported that Drs. G. H. Newcomb, ('55) and T. D. Crothers, ('65) had agreed to present reports, as class historians for their respective classes, at the annual meeting of the association. On motion, he was authorized to appoint historians

for the classes of '75 and '85, to fill vacancies. The corresponding secretary was authorized to have the usual notices announcing the annual meeting, invitations, etc., printed and to issue the same; also to procure suitable badges. The recording secretary reported that the number of names with addresses upon the Alumni list was 1,243, and the total number of graduates to, and including the class of '94, was 2,055. Deaths reported during the past year, thirteen. On motion of Dr. Bendell, the report was received, adopted and ordered placed on file.

The treasurer, Dr. T. F. C. Van Allen, presented his report for the year, from which it appeared that he had received from his predecessor in office, \$140.18; from dues, \$118.00, and for interest, \$5.54, and that the disbursements during the year had been \$116.39, leaving a balance on hand of \$147.33. On motion, his report was referred to a committee consisting of Drs. S. Le Fevre, C. B. Herrick and L. B. Rulison, who examined the same, compared the disbursements with the accompanying vouchers, and subsequently reported it correct. On motion, the report of the committee was received and the committee discharged, and the report of the treasurer accepted and ordered placed on file.

The president's address being the next order of business, ex-president Woodruff was called to the chair, and president Van Vranken delivered the following address:

PRESIDENT VAN VRANKEN'S ADDRESS.

Fellow Alumni and Gentlemen:

It has been said, that to every individual, community, and nation, there comes a period when a *review* is in order. With advance in the scale, there is an advance in the responsibilities; so it has been with medicine, a science so called, which hardly yet can be said to have attained the summit of its hopes, however honest its endeavors may have been to reach the full fruition of its ambition.

A cynic has remarked that *vanity* lies at the root of most human action; and any effort made at this time to pose as a reformer, would only merit a criticism of suspected motives, and "Egotism would be charged as masquerading as enthusiasm." The student of to-day appreciates as never before, the constant widening of the field of medical knowledge, and realizes the impossibility of being equally proficient in all the varied departments which have been developed during recent years. Breadth of vision comes only from breadth of knowledge, and the opportunities for acquirement are too many, and the demands of the public are too great, to allow ignorance to flourish, or to excuse its existence in the man who makes pretense of medical skill.

In our attempt at enlightenment for the future, everything that savors of the past, ought *not* be classed as effete; nor should we pride ourselves on being therapeutic *nihilists* in destroying, without substituting. In this process of medical evolution, we are to interpret phenomena, as yet "Within range of a vision, subject to many errors of refraction." Men of the younger generation frequently fall into the error of supposing, that all that is known of medicine is of recent date.

Medical Trilbyism is abroad in the land, and is now readily recognized, in every day professional life. Its appearance, however, while indicative on the one hand of much that is visionary and fleeting, on the other, shows the tendency of our profession to eagerly grasp anything savoring of advance along professional lines.

Just here, we sincerely believe, that the generation to which you, who are entering the profession belong, will make immense strides forward, in the direction of treatment by *natural*, rather than by artificial means or agencies. Long ago it was discovered that acute febrile diseases, require, far above all drug medication, mild liquid diet in the period of excitement, and stimulants and nutritives in that of exhaustion.

The reputation of the great Sydenham consisted in his prescriptions of simples, and not by great pharmaceutical combinations. He dared to order fresh air for small-pox patients, and horse-back riding for consumptives, in place of the cumbersome rubbish of the then established schools. Abused by his contemporaries, he says: "I must needs conclude that I am void of merit, or, that the candid part of mankind who are found with so excellent a temper of mind as to be no strangers to gratitude, make a very small part of the whole." If in the pursuit of truth, the world is as ungracious in this end of the 19th century as it was in the 17th, learn a lesson of reliance from the same illustrious source when he says "'Tis none of my business to inquire *what* other persons think, but to establish my own observations."

To my mind, our advancement as a profession, has been greatly impeded, if not obstructed, by a blind devotion to established principles so called, regardless of the foundation upon which many of the tenets of medicine have rested.

The physician of to-day is learning much from his surgical brother, who is naturally far in advance of him, principally because the latter has better opportunities for noting the effect of his remedial measures. To even allude to the brilliant results reached by surgery at the present time, is superfluous. The marvellous ends attained in this field surpass in detail, the most visionary dream of Jules Verne or Edward Bellamy.

It is related of a young surgeon during the late war, who was caring for the wounded at Bull Run that having nothing but water "for dressing, he was astonished to see how well the wounds did under that simple treatment." This is paralleled in the extreme, by the conversation of a man who made application to drive what he called "an avalanche wagon." On being asked "if he knew how to deal with wounded men," he answered "O yes, if they are hit here," pointing to the belly, "knock 'em on the head, they can't get well." While this was essentially true thirty years ago, or even ten, how far from the surgical truth it is to-day. To the physician, however, until the

present year, little has come that has kept at even a *remote* pace with surgery. A few years since, very recently indeed, we who are known as general practitioners, were suddenly given new life by the discovery of Dr. Koch and his use of *tuberculin* in the treatment of phthisis; only to find that our dream of the long looked for specific for that disease was an ingis-fatuus luring us to heights from which our fall has been very great. Now, we are again at flood-tide, borne onward by antitoxin, which we believe has merits, although the recent death ascribed to its use, will undoubtedly deter many from its early adoption. Antitoxin, however, is still in its very early infancy, and while we have much to hope for, from it in diphtheria, are not warranted by results thus far attained, in building largely upon its ultimate value.

Cerebrine, Thyroidine and the various animal extracts are coming and going like the brook, and will probably like it, go on forever. Oliver Wendell Holmes has justly said "What is the meaning of these perpetual changes and conflicts of medical opinion and practice, from early antiquity to the present or our own time. Simply this: All *methods* of treatment end in disappointment of those extravagant expectations which men are wont to entertain of the healing art. The bills of mortality are more obviously affected by drainage, than by this or that method of practice. The insurance companies do not commonly charge a different percentage on the lives of the patients of *this* or *that* physician, who in the course of a generation, themselves are liable to weary of a practice which has so little effect upon the average movement of vital decomposition. Then they are ready for a change, even if it were back again, to a *method* which had already been tried and found wanting." Then comes the usual talk about a change in the *character* of disease, which has about as much meaning, says Holmes, as that concerning "Old fashioned snow storms." "Epidemic constitutions" of disease mean something no doubt; a great deal as applied to malarious affections; but that the whole type of disease undergoes such changes that the practice must be reversed from depleting to stimulating and vice versa, is much less likely than that *methods* of treatment go out of fashion and come in again.

Phthisis, as a contagious disease, is being much agitated to-day, and health boards in some of our large cities are seeking to class it as such along with the eruptive fevers and diphtheria. Opponents of this theory, clinically speaking, assert with much apparent show of reason, that this can not be true, except to a very limited extent; for the opportunities for the spread of phthisis are so great that were it contagious, in the broad sense of that word, half of the present population of the United States would be swept from the face of the earth in twenty-five years, and the past conclusive history of the part played by heredity in this affection would go for naught. Thinking minds must admit that the truth lies in a happy *medium* between these extremes, and that while the tubercle bacilli is specific in its results, the particular soil, in the formation of which heredity has no small part, must be favorable for its development. In the meantime while medical theories are coming in and going out, there is a set of sensible men who are never run away with by them, but practice their art sagaciously and faithfully in much the same way from generation to generation. Holmes again says, "That from the time of Hippocrates to that of our own medical patriarch, there has been an apostolic succession of wise and good practitioners."

As members of the Alumni Association of the Albany Medical College, we can, without boasting, congratulate ourselves and our Alma Mater on her present prosperous condition, the registration for the current year being the largest in the history of the institution. The faculty are also to be commended for the very successful adoption of the strictly graded course, and their determination in the near future, to add another year to the curriculum already established.

The success of the present year makes very evident the necessity for greater college facilities. This venerable building, fraught as it is with many memories of bygone days and faces, has outlived its usefulness and worthily earned the title of "Emeritus."

With a new college building, a full four years graded course, and the present faculty, the medical department of Union University would stand to-day the peer of any similar institution, and ought to receive the loyal support of every alumnus.

To the Graduating Class of '95:

Conventional custom constrains me to welcome you, the members of the class of '95, to the ranks of our honorable profession. In this instance, however, it is my intention to deviate somewhat from the beaten tracks heretofore universally followed on similar occasions, and to lay aside the stereotyped expressions which have grown gray in the service. While I claim no kinship to the immortal George, "Who could not tell a lie," my regard for the truth is such that it must be spoken at this time. On behalf, therefore, of the alumni of the Albany Medical college who are now engaged in the active practice of their profession, and whose mouthpiece I at present am, I am compelled to say that from our hearts, we cannot *joyfully* welcome any additions to our already overcrowded ranks. Candidly, we do not want you; the people do not need you; the country has no demand for your services. Our family board is full to repletion. We want no more brothers, and regret that our Alma Mater, now far beyond the normal age for child-bearing, has not ceased her prolific fecundity and lapsed into a state of "innocuous desuetude."

Although we have a mother in common, mind you, not a common mother, and many fathers, professionally speaking, we can not call you illegitimate, but regular withal; and inasmuch as you are here through no fault, but the virtues rather of your own, I presume we must do as has so often been done before, forget and forgive, and receive you with loyal welcome, from the fact that we now have *no choice* in the matter.

We ask, however, in all sincerity, that we, who are becoming with the passing years, the elder brothers if not the fathers in the profession, may receive some consideration at the hands of our younger brothers. I have often felt that the members of the graduating classes in our medical colleges have become impressed, in some mysterious way, with the thought, real or fancied, that the world at large, like the Psalmist of old, had been patiently waiting "For some one to deliver them from their distresses," and that their advent upon the scene would eliminate and overthrow all the old fogysm of their professional predecessors, for whom humanity in general would then have no further use. Well do I remember my own conceit at the successful termination of my first seven consecutive cases of typhoid fever, three of

which were complicated by hemorrhage. In imagination, I was the medical Moses raised up to lead fever patients into the promised land. The fatal termination of my next three cases, however, soon convinced me that there *were* heroes before the days of Agamemnon.

When I think of the nine thousand or more graduates in medicine annually thrust out in the United States, and the strife for bread winning as it exists to-day by those already at work, I can but hope that, figuratively speaking, the "east wind may be tempered to the shorn lamb graduates," as they set out to graze upon "fields," not white to the harvest, but already nipped to barrenness.

Against this, however, is the positive side of the picture which will brighten as the purpose and intensity of your lives may develop it. Genuine worth and sterling integrity ordinarily succeed even under adverse circumstances. You can make place and position for yourselves, as others who have preceded you have done; but have a care that in reaching this, you have no cause to regret in after years the means by which you attained it. Permanent elevation has never yet been reached by pulling others down.

In conclusion, the advice given by old Polonius to Laertes is equally applicable to you:

"The wind sits in the shoulder of your sail, and you are staid for. Look thou character. Be familiar, but by no means vulgar. Give every man thine ear but few thy voice. This above all; to thine own self be true, and it must follow as the night the day, thou canst not then be false to any man."

The members of the class of '95 were present in a body, and rose as the president addressed them at the conclusion of his address, and received them into membership in the association.

Dr. Powell moved a vote of thanks to the president for his interesting address, a copy of which he was requested to furnish for publication. Ex-President Woodruff put the motion to a vote and declared it unanimously carried.

President Van Vranken then resumed the chair.

The report of the historian was then read as follows:

REPORT OF HISTORIAN, DR. E. A. BARTLETT.

The history of an association like ours may be written by one man, but it is created by its members. History, like the oak tree, is of slow growth and is constantly being made. The events of this day will to-morrow be history. Each event of our lives, trivial though it may seem, is a stone for the great structure that is to be. An historian's work is to gather these stones and, having properly placed them, present the building fitly framed. We present you to-day a few of the stones we have gathered.

We have a glorious record to look upon. From these halls have gone men of character and of brain. The world of science and of thought has been enriched by their labors. There is still another record written in the heart

of man, for many a home has been brightened and many a sufferer made to rejoice in health restored by the faithful ministrations of those who have graduated from our college.

Many of our members are enrolled on the other side, and while we mourn because they are not, we can not but rejoice that their day of labor is past and the time of their reward is at hand.

The history of our association dates back to twenty-three years ago, when a handful of earnest men devised a plan that should be of help to all who might avail themselves of its resources. Knowing that in the bundle of faggots there is more strength than in the single stick, they believed if the graduates of A. M. C. could be bound by closer ties great good would come to each, and benefit to our Alma Mater. They "builided better than they knew." Out of the mere handful has grown this great association. New zeal has been inspired, increased love for our old college has developed, and tangible, practical aid has been given. Year by year the association has grown, and as our coming together has quickened our interest in one another, some of our interest, some of our enthusiasm has been imparted to the college. As a result the best that could be obtained has been sought, the curriculum has been steadily enlarged, the course has been lengthened, the teaching corps strengthened, and to-day, we, the Alumni of A. M. C., rejoice in an institution second to none in advantages for students.

What lesson shall we learn from our history? Certainly this: If the interest and enthusiasm already manifested by the members of the association have wrought so great benefit, what could be done if that interest were doubled? Let each one of us, then, realize the responsibility resting upon us, first, to make the cleanest, purest, best record each for himself; second, to exert all the force of our personal influence for our beloved college home; third by our presence at these annual meetings to instil an enthusiasm such as shall be irresistible.

You, gentlemen of the class of '95, by virtue of your graduation, members of our association, we welcome with open arms and bid you God speed. Go forth with the three points of our lesson fixed in your minds, resolved to be and do your best.

E. A. BARTLETT ('79),
Historian A. A. A. M. C.

On motion, the report was received and ordered entered on the minutes.

Reports were called for from the class historians of '55, '65, '75 and '85, but none were presented.

The recording secretary read the following:

NECROLOGY.

Dr. John F. Norbury ('44), at New York city, January 13, 1895.

Dr. David Frazier ('47), at Cobleskill, N. Y., August 2, 1894, aet. 74.

Dr. Francis G. Mosher ('48), at Coeymans, N. Y., September 2, 1894, aet. 71.

Dr. Lansing Griffin ('57), at Elmira, N. Y., November —, 1894.

Dr. Darius Scofield, ('58), at Washington, Ia., April 15, 1893, aet. 59.

Dr. Peter M. Murphy ('63), at Albany, N. Y., June 27, 1894.

Dr. Isaac De Zouche ('69), at Gloversville, N. Y., February 22, 1895, aet. 72.

Dr. Cyrus Ecker ('74), at Chesterville, N. Y., October 22, 1894.

Dr. George E. Elmendorf ('75), at Coeymans Hollow, N. Y., June 16, 1894, aet. 43.

Dr. Robert Fuller ('75), at Schenectady, N. Y., May 9, 1894, aet. 71.

Dr. Stephen T. DeLaMater ('80), at Palmyra, N. Y., October 29, 1894.

Prof. Henry B. Nason (hon. '80), at Troy, N. Y., January 18, 1895.

Dr. Chauncey A. Patterson ('92), at Griffin's Corners, N. Y., May 5, 1894.

The recording secretary presented the following obituary notice of the late Dr. Darius Scofield ('58), which had been prepared by Dr. I. E. Randall ('66):

OBITUARY NOTICE OF DR. DARIUS SCOFIELD.

Dr. Darius Scofield, late of Washington, Iowa, an alumnus of our college of the class of '58, died at his home in Washington, April 15, 1893.

Dr. Scofield was born in Corinth, Saratoga county, N. Y., July 31st, 1834. He received a good academic education, after which he studied medicine and graduated at the Albany Medical College in 1858. He took a course in the Bellevue Hospital Medical College, and graduated in that institution in 1878.

He located in his native town, Corinth, immediately after graduating, and enjoyed a large practice from the first until 1863, when he entered the army and served until the close of the war. He was detailed as surgeon in charge of United States General Hospital, No. 3, at Vicksburg, Miss., soon after the capture of that stronghold by Gen. Grant, and was very successful in the management of the same. He was always loved by the sick and wounded soldiers, and was very popular with his brother surgeons who were under him. At the close of the war, Dr. Scofield located in Washington, Iowa, where he had a large general and consultation practice. He was for several years president of the Washington County Medical Society, and was also elected president of the Iowa State Medical Society. He did much towards elevating the profession and medical education in his county and state. Dr. Scofield was always a public-spirited man and took a deep interest in public affairs. He was for several years alderman of his city, was instrumental in establishing a free public library there. The local papers in speaking of him said: "His opinions on all lines, scientific, religious, political and social, were very decided, and he could always give cogent reasons for the faith that was in him. He was an omnivorous reader in science not only, but in general literature, and found time by utilizing spare half hours to absorb a vast miscellany of information and knowledge. With a retentive memory, he was an incarnate cyclopedia, and knew more out-of-the-way things, as well as in-the-way things, than one man in a hundred thousand."

About eight years before his death he had a small epithelioma removed from his right temple. The wound healed, but about two years later, after receiving a slight bruise over the scar, the disease returned and assumed the form of a corroding lupus. The bone soon became affected and the brain was exposed. Its progress was slow, and for two years before his death there

was a circular opening in the skull fully three inches in diameter, exposing the right anterior lobe of the brain, and a depression in it from one to one and one-half inches. Strange to say his mind was not affected until the last two or three weeks of his life, seeming to be as active as ever. He would often examine the wound as critically as though he were examining a patient, and comment on the probable progress and duration of the disease. In November, 1891, to satisfy his friends, he, accompanied by the writer, went to New York to consult a specialist, although he had no doubt of the final termination of the disease. At his request we stopped a few hours in Albany to visit the old college building, on Eagle street, where we had graduated. He was disappointed when we reached there to find there were no lectures at that hour, as he wished to meet some members of the faculty. He looked through the old museum and seemed to feel it was his last visit to the old college he loved so well.

Two years before his death he wrote out minute directions as to the disposition of his body after death. He had for years been a warm advocate of the cremation of the dead, and requested that his own body should be so disposed of. It was, therefore, taken to a crematorium, incinerated and the ashes deposited in a grave in his family lot in the cemetery. This was characteristic of the man. He desired that his convictions, which he had advocated, should be carried out on his own person.

He died as he had lived, a brave, upright, honorable man, who was never guilty of a dishonorable act; a loved and skillful physician and surgeon, a credit to himself and his Alma Mater.

The doctor had been married twice. His first wife, a beautiful, cultured lady, died in 1872, leaving one daughter who yet survives her parents. In 1880 he married again. His wife and their two sons survive him and reside at the family residence in Washington.

The committee appointed to nominate officers presented the following report which was read by its secretary, Dr. Washburne:

For President,

Dr. THEOBALD SMITH ('83), Washington, D. C.

For Vice-Presidents,

Dr. ROBERT V. K. MONTFORT ('56), Newburgh, N. Y.

Dr. DANIEL C. CASE ('70), Slingerlands, N. Y.

Dr. CHARLES K. FRAZIER ('73), Cobleskill, N. Y.

Dr. LUMAN B. RULISON ('84), West Troy, N. Y.

Dr. JOHN W. KNISKERN ('90), Amsterdam, N. Y.

For Recording Secretary,

Dr. WILLIS G. TUCKER ('70), Albany, N. Y.

For Corresponding Secretary,

Dr. JOHN BEN. STONEHOUSE ('71), Albany, N. Y.

For Treasurer,

Dr. THEODORE F. C. VAN ALLEN ('83), Albany, N. Y.

For Historian,

Dr. EZRA A. BARTLETT ('79), Albany, N. Y.

For Members of Executive Committee (term three years),

Dr. HERMAN BENDELL ('62), Albany, N. Y.

Dr. HENRY E. MERENESS ('74), Albany, N. Y.

Dr. ROBERT BABCOCK ('84), Albany, N. Y.

Dr. ARTHUR G. ROOT ('90), Albany, N. Y.

And to fill vacancy for one year,

Dr. WILLIAM L. SCHUTTER ('83), Albany, N. Y.

On motion of Dr. Cook, the report was accepted and adopted, and the recording secretary was instructed to cast a ballot on behalf of the association for the gentlemen named therein. This having been done, those named in the report were declared by the president duly elected officers of the association for their respective terms.

Miscellaneous business being in order, Dr. Bendell made some remarks in which he advocated broadening the field of the association. Various of the suggestions made by the president in his address to-night ought to be considered. He had well said that the present college building deserved the title of "emeritus," for it was by no means adequate to the needs of the institution. Might not the Alumni association take the initiative in the matter of the erection of a new building? The matter was discussed by Dr. Cook and others. The president suggested the appointment of a committee to confer with the faculty about the matter. After some further discussion Dr. Cook moved that the matter be referred to the executive committee. Carried.

The recording secretary reported receipt of photographs from the following Alumni: Drs. D. S. Beardsley ('40), J. N. Hubbard ('63), and H. T. Pearse ('92). He read letters received from certain members of the association unable to be present at the meeting, and letters of regret at their inability to attend the Alumni banquet, from Chancellor Upson, Regent McKelway and other invited guests.

The president-elect, Dr. Theobald Smith, was called for and made a few remarks, thanking the association for the honor conferred upon him.

After the announcement of the order of exercises for the afternoon and evening, no other business appearing, the meeting adjourned.

The association reconvened at twelve o'clock and listened to the following

LECTURE BY DR. THEOBALD SMITH, (83).

ANTITOXIC AND MICROBICIDE POWERS OF THE BLOOD SERUM AFTER IMMUNIZATION, WITH SPECIAL REFERENCE TO DIPHTHERIA.

In endeavoring to present to you a succinct account of the history and present status of serum therapy and the use of antitoxic serum, I find myself antedated by most medical journals, some literary magazines, the daily press, and even the advertising pharmacists. All these channels of publication, so far as they have come to my notice, have presented the facts in a clear manner and have refrained from a too enthusiastic expression as to its probable place in the physician's list of efficient remedies. Besides being thus antedated, I am also laboring under the disadvantage of not having thus far been engaged in the manufacture of the antitoxine of diphtheria. When, therefore, I received the invitation to give a lecture before you on this occasion, I paused to recount my qualifications for such a task. Finally, after much reflection, I came to the conclusion that it was no business of mine to settle this matter, but that it was my duty as an alumnus to do as I was asked to do. Hence I am here as a bacteriologist to speak impartially upon the possibilities and limitations of serum therapy with special reference to its application to the cure of diphtheria.

It will be remembered that the earliest attempts to make bacteriology of service in the suppression of infectious diseases were made by Pasteur. His efforts were founded on the older theories then in vogue, that all susceptible individuals should be made to pass through a mild form of the disease to be combatted. One of the applications of this principle which has been and still is of great service to mankind, is vaccination against small-pox. Protective inoculation is practiced upon domesticated animals in Europe for at least four infectious diseases, and has been recently attempted in India as a preventive for Asiatic cholera. However much we may admire the genius and the persistency of Pasteur in putting into practice this principle of protective inoculation for both man and beast, we can not shut our eyes to the numerous objections which may be urged against the extension of this method in practice. Only one of them—the numerous vaccinations which it would be necessary for our children to undergo before they could be considered fairly well protected—has been the subject of more or less ridicule. The absence of much promise in this direction has strengthened the hands of practical sanitarians whose function it is to keep disease from spreading, rather than to prepare the human body for its reception.

In the meantime, medical science, recognizing the fact that without an insight into the mysterious processes of disease, progress is impossible, set itself the task of studying the relations between the animal body and the disease germ. What are the processes by which in the one case the body can finally subdue invading bacteria, and, in the other, be subdued by them? What are the changes which the tissues undergo when a mild infection acts upon them so that subsequently a severe infection can gain no foothold?

These are old questions, questions which confront every physician, and to which he undoubtedly gives much thought. But the new branch of medicine, bacteriology, became equipped with new instruments with which such problems could be probed to a depth hitherto not even imagined, and to-day by many not even believed. Some light was shed on these problems when Metchnikoff presented his theory of the way in which bacteria are destroyed in the body. According to his observations, bacteria are taken up by certain cells, now denominated phagocytes, within which they are destroyed by a process akin to digestion. Summed up in a few words, the phagocyte theory assumes that all efforts made by the organism for its own protection, all changes induced by external agencies which tend towards a greater resistance of the body, finally act upon the phagocytes so as to enable them to ingest and destroy more easily the intruding and multiplying bacteria. Against this strictly cellular theory of immunity, there appeared a current of experimental evidence which called in question the importance of phagocytic activity. It might be called the humoral theory, which made the blood the focal point of immunizing processes. As early as 1885, Fodor found that bacteria injected into the blood of rabbits disappeared so promptly from it that only a rapid destruction could account for it. Wyssokowitch somewhat later observed the same phenomena without, however, interpreting them as the result of destruction. He claimed that the injected bacteria were largely deposited in the capillaries of the various organs, such as the spleen, liver, kidneys, and marrow of the bones. Later, Nuttall demonstrated that the blood serum of rabbits does actually destroy anthrax bacilli. By mixing blood serum in a test tube with a definite number of bacteria and determining the number in the mixture from hour to hour, a very decided reduction was noticed after four or five hours. Here was a fact of great importance, recording a bactericidal action of the blood after all cellular elements had been removed. In order to determine the conditions under which this destruction took place, Behring and Nissen examined the behavior of the blood serum of a large number of animals towards a variety of bacteria. In this arduous investigation a number of curious and conflicting facts came to the surface, which made it evident that immunity, natural or acquired, was not, as a rule, synonymous with a bactericide action of the blood, although it might be in special cases. In order to make this general statement clearer, let me cite some of the results obtained by Behring and Nissen:

1. The blood of the insusceptible white rat destroys anthrax bacilli, but does not destroy the micrococci of pneumonia.
2. The blood of guinea pigs destroys the spirilla of Asiatic cholera, but does not destroy the very closely related *Vibrio Metchnikovi*. *
3. Though the blood of guinea pigs fails to destroy *Vibrio Metchnikovi*, yet when guinea pigs have been made immune towards this bacterium the blood of such guinea pigs does destroy them.

This last fact plainly points to the appearance of substances in the blood after immunization which are inimical to bacteria. But even more suggestive than this was the fact that such blood has no increased destructive power towards other bacteria. There could be no doubt as to the general signifi-

* This statement has been questioned since.

cance of these results. The bactericidal action of the blood bore some relation to the protective mechanism in the body, but this relation was by no means clear.

Since these experiments were made much has been done to define more precisely this destructive action of blood serum, especially with reference to the spirillum of Asiatic cholera. To this phase of the subject I will return later on.

In order that we may understand the next step in the development of serum therapy, it will be necessary to go back a little, and trace the growth of our information concerning certain important products of bacterial life. With the development of our knowledge concerning the action of pathogenic bacteria upon the animal body, there arose and became dominant the view that bacteria acted through certain poisonous products, either secreted by them or formed by them out of the culture media in which they grew; or set free from their own bodies during disintegration. Brieger's name is intimately associated with the work of isolating certain alkaloidal products known under the general name of ptomaines. These poisons were, however, present in such minute quantities when found at all and their action so uncertain that their significance remained a matter of conjecture.

It was not until 1888 that this doctrine gained a firm foothold by reason of the researches of E. Roux and Yersin in the Pasteur Institute, in Paris, upon the bacillus of diphtheria. These authors showed that not only the diphtheria bacillus itself could produce diphtheritic affections and paralysis in animals but that the culture fluid in which these bacilli had multiplied and from which they had been removed, could produce a fatal toxic disease. Here we have demonstrated for the first time the existence of bacterial poisons which may act quite independently of the germs which produced them. These poisons could be precipitated from the culture fluid, dried and redissolved in water without losing their pathogenic properties. These were destroyed by heat, sunlight and a variety of other agencies. This important work furnished medical science a satisfactory explanation of the symptoms of diphtheria in man. A local vegetation of bacteria in the throat to produce such pronounced constitutional disturbance must act through some soluble poison absorbed into the body from the seat of the local disease. The extremely poisonous nature of this bacterial product may be appreciated when we bear in mind the fact that since then cultures have been found so virulent as to prove fatal to guinea pigs when only .005 of a cubic centimeter of the filtered fluid is injected under the skin.

In 1889 another bacterial poison was discovered, which proved even more fearful in its effect on animal life than the poison of diphtheria. Kitasato, a native of Japan and a pupil of Koch, has done more than any other in making us acquainted with this poison. The disease known as tetanus was shown by him to be due to a bacillus of peculiar character upon which I need not dwell here. After having mastered the difficulties surrounding its isolation from wounds, he found that even after the culture fluid had been passed through a Chamberland filter in order to deprive it of all living tetanus bacilli, a very minute dose was sufficient to produce in various animals the whole train of symptoms characteristic of tetanus. But more than this, the blood and serous fluids of those animals which succumbed to this poison contained enough of it to produce the same disease in a second set of animals.

We have thus the remarkable phenomena of two diseases produced without the presence of the germs, simply by their products. And what are these products? While Roux and Yersin regard them as enzymes, the German observers have regarded them as albuminous in nature and given them the name of toxalbumins. The toxalbumin of tetanus is quite sensitive to light and to temperatures above 55° C. It loses its virulence when dried at the temperature of the blood in the thermostat. It remains unaffected when water is added but is speedily destroyed by chlorhydric acid in less than one-half per cent solutions.

Among the many pathogenic bacteria which have been studied these two stand out preeminently as toxin producing. Though poisons are demonstrable in cultures of most if not all pathogenic forms, their action is feeble as compared with these. This fact, together with certain other differences, emphasized the division made some years ago by Koch between the infectious and the toxic diseases. The bacteria producing the infectious diseases multiply within the organs of the body whereas those which produce the toxic diseases remain outside of the body—in the throat in diphtheria, in the wound in tetanus, and by the diffusion of their poisons manufactured in these places completely subdue the resistance of the body.

In 1890 publications appeared which called attention to a most striking relationship between these toxins and the blood of an immunized or vaccinated animal—which in other words, gave to the world the essential principles of serum therapy as we know them to-day. In December, 1890, Behring and Kitasato announced the new principles as deduced from their experiments with the poison of tetanus as follows:

1. The blood of rabbits made insusceptible to tetanus possesses the power to destroy the poison of tetanus.
2. This power resides in the extravascular blood as well as in the blood serum free from cells.
3. This power is of such permanent nature that it remains active in the organism of other animals. It is thus possible to produce pronounced therapeutic effects by the transfusion of blood or serum.
4. The power to destroy the poison of tetanus does not reside in the blood of animals which are not immune towards tetanus.

These statements were deducible from the following experiments: A rabbit was made insusceptible to the poison of tetanus by the injection of iodine trichloride and the repeated injections of augmenting doses of the tetanus poison. Blood drawn from such a rabbit as well as the serum therefrom was injected into the abdominal cavity of white mice. Inoculated twenty-four hours later with a fatal dose of the tetanus culture, the treated mice survived, the untreated mice died within forty-eight hours. When this blood serum was mixed with culture fluid in which tetanus bacilli had multiplied, and the mixture permitted to stand twenty-four hours, the mice resisted successfully 300 times the fatal dose of the culture fluid contained in this mixture. The fearfully poisonous character of this culture fluid was shown by the fact that .0001 c. c. was sufficient to kill a white mouse within two days. Therapeutic results were also obtained by infecting mice with the spores of tetanus bacilli and after the tetanic symptoms had appeared, injecting serum from an immunized horse.

These being the essential facts relating to the new serum therapy, let us scrutinize them somewhat more closely. In the first place, the fundamental problem is the immunizing of susceptible animals which are to furnish the therapeutic serum. This is the most difficult and tedious part of the work, not only in diphtheria but in all other experimental diseases. It is comparable to the slow hoisting of the heavy weight which, having reached the top, is to do more efficient work in an instant than numberless light blows could do. Hence the antitoxin serum is not a *perpetuum mobile* which hopes to get something out of nothing. For diphtheria it means the laborious treatment of a horse for six to nine months at least. At first, only very small doses of the culture fluid in which the bacterial poison has been slowly forming, are injected. These are gradually increased until finally, the horse can stand two to three hundred times the first dose of poison administered.

When the fresh blood or the blood serum of such a protected animal is mixed with the poison and injected under the skin of susceptible animals, the latter are able to bear many times the fatal dose with either a slight illness or no disturbance whatever. There has appeared a mysterious something in the blood of the immunized animal which neutralizes or destroys the bacterial poison. As the latter has been called toxin so the former is called anti-toxin. The power of the antitoxic serum depends within certain limits upon the amount of toxin the animal which furnishes the serum can bear, in other words, upon the length of time during which the animal has been under the preparatory treatment.

In view of this variability of the antitoxic power it is of the utmost importance to know just what any given serum can do. Behring early foresaw this necessity, and suggested several means of standardizing the serum, of which only one is now used by him. This depends on the fact that when toxin and antitoxic blood serum are mixed in a tube they tend to neutralize each other, a definite quantity of antitoxin destroying a definite quantity of the diphtheritic poison. In practice, Behring starts with the following arbitrary unit of strength:

If ten times the quantity of toxin necessary to kill by subcutaneous injection a guinea pig weighing 300 to 400 grams is exactly neutralized by a certain quantity of the serum, the latter is supposed to contain one antitoxic unit. In Behring's "normal serum" 0.1 c. c. does this work. Starting with a serum of unknown power, the standardizing is carried out in the following simple manner. Ten times the quantity of the toxin required to kill a guinea pig after subcutaneous injection (which in Behring's standard virus was equivalent to about 0.9 c. c.), is mixed with different quantities of the antitoxic serum and injected into a series of guinea pigs. Of this series, some may die promptly, others more tardily; some may pass through a mild disturbance associated with local indurations at the seat of the injection and loss of weight, while others may not show any signs of disease either local or general. If the quantity of serum which is sufficient to neutralize the poison and keep the guinea-pig well was 0.01 c. c., each c. c. would contain 100 antitoxic units. If only 0.007 c. c. of serum was needed to accomplish the same thing, there would be 140 antitoxic units in one cubic centimeter of

this serum. This standard unit, as stated above, is purely arbitrary and may be replaced by any other. But in order that we may know accurately the comparative strength of the antitoxines, some such uniform standard as this is quite essential. Roux uses a different standard. The strength of the blood serum is quoted by him in units of the body weight of a guinea pig which can be protected from a fatal dose of the poison. Thus a serum of 50,000 protects a guinea pig from a fatal dose of the culture fluid when 1-50,000 of its weight of serum is injected twenty-four hours before the inoculation with a fatal dose of culture fluid. For a guinea pig weighing 300 grams this protective dose would be 300-50,000 or 0.006 grams, or roughly, 0.1 grain.

Since the French and German standards are not directly comparable, it was necessary to make direct tests of serum from both sources according to both methods. This task has been accomplished by Janowski. According to his results, the French 50,000 serum is nearly equivalent to the 60 unit serum of Behring (No. 1). The 100,000 serum is nearly the same as Behring's 100 unit serum (No. 2).

It has been already stated that the serum of immunized animals not only protects the body when it is introduced before or with the virus, but it is capable of curing the disease induced by the poison or by living diphtheria bacilli when under way. It possesses, therefore, therapeutic as well as protective properties. It is the therapeutic properties which are of the greatest value, although the power to prevent disease in times of epidemics is not to be lightly estimated. When the serum is injected as a preventive much less is needed than when symptoms of disease are already manifest. The greater the delay in the application of the remedy after the disease has appeared, the less likely is it to have any power to stay the disease. Here we have once more illustrated by exact scientific data the force of the old adage that "an ounce of prevention is better than a pound of cure."

We have now before us the vexed question concerning the nature and mode of action of the antitoxic substances which appear in the blood during immunization. The first theory which suggested itself to Behring is that of direct neutralization of the toxin by the antitoxin. When the fatal dose of poison and the serum are mixed in a certain proportion and the mixture injected into a susceptible animal, no effect, either local or general is noticed. When the amount of serum in the mixture is decreased, local indurations appear, and when still smaller doses are used the injected animals succumb.

When the diphtheritic poison and the antitoxic serum are injected separately in different regions of the body, the latter some hours earlier, from thirteen to fourteen times this quantity of serum is needed to prevent any local indurations, and from five to six times the amount simply to prevent death. In spite of this apparently very definite evidence that the antitoxin neutralizes the toxin in this chemical sense, and thereby destroys it, observations are not wanting which militate against it. Roux discovered the important fact that when a mixture of the antitoxin and the toxin which has no effect on normal guinea pigs be injected into those which have been previously immunized against Asiatic cholera, the fatal effect of the apparently neutralized poison reappears. Similar results were obtained when guinea pigs had been exposed to other

bacterial poisons. Behring has also observed a fact which seems to contradict the neutralization theory. In the case of horses which were undergoing immunization he found that animals became after a time sensitive to a quantity of poison which a little of their own blood would promptly neutralize in a test tube. Evidently we are dealing here with factors which appear simple, but are really complex and the contradictory evidence concerning their theory of action must be attributed to a deficiency of knowledge which time will undoubtedly make good.

Without any stable theory of the action of antitoxins it might appear useless to discuss their nature at this time, and I shall content myself with the simple statement of a few hypotheses. The specific nature of these protective substances, in virtue of which the antitoxin of diphtheria is powerless to overcome the toxins of disease germs, other than that of diphtheria, has led Büchner to promulgate the theory that antitoxins are derived from the injected toxins, in other words that the latter have been converted into non-poisonous, protective substances by the cells of the animal body. The antitoxins are, in this sense, simply bacterial products modified by the tissues of the body into which they are injected, and made capable of counteracting the poisons from which they are derived. Their wonderful action is on these grounds made simple by Büchner, who looks upon it as only a modification of the methods of vaccination in vogue for many years past and therefore not an essentially new method. When the antitoxin acts after the disease has broken out, as in human diphtheria, he believes that it simply immunizes, protects or vaccinates those regions or cell territories of the body not yet affected by the poison, and thereby causes the disease to halt. The theory at first suggested by Behring would assume a neutralization of the poison already in possession of the field.

Whether the antitoxins are toxins transformed by the cell activity of the body, or whether they are weapons created anew by this same cell activity under the irritation caused by the presence of bacteria and their toxins, as is assumed by the French school, we must leave undecided. As regards their *modus operandi* it may be safely stated that the weight of evidence is against the theory of direct action of antitoxin upon toxin, and in favor of the theory that the antitoxin acts only by stimulating the powers of resistance of the body cells. Another question which here presents itself is the nature of the immunity conferred by the antitoxins. When an animal is inoculated with attenuated or sterilized cultures of certain specific disease germs, it passes through a mild attack of the disease. There are fever and other symptoms of illness noticeable for a time. A second, larger dose of the same culture may lead to the same transitory symptoms. Finally, after a series of such inoculations or vaccinations, the animal is able to withstand once or many times the dose of the virulent culture sufficient to kill the untreated animal in a given time. Such immunity may last at least six months, and usually lasts much longer. It is an active immunity resulting from a certain change in the attitude of the body cells towards the specific disease germ. Such animals are truly vaccinated. Their blood possesses antitoxic or bactericidal powers, according to the disease towards which they have been made insusceptible. When such blood is injected into other animals the latter manifest no fever, no

illness, no reaction of any appreciable amount. They are, nevertheless, immune, for if a fatal dose of the specific bacteria or their toxin be injected soon after, the system pays no attention to it if enough serum has been used. This immunity does not last very long, for diphtheria only about six weeks. It is an immunity acquired without any effort on the part of the body, and hence it leaves no permanent changes behind. The blood of such an animal cannot confer immunity upon another. It is essentially a passive immunity. These facts are now taken into consideration in the vaccination of domesticated animals against a certain infectious disease. The animal receives an injection of the serum from a protected animal, and soon after, while still under its influence, it is inoculated with the living virus. Without the protection of the serum it might be seriously injured or even killed by the living culture. Without the culture the passive immunity would not be reinforced and would soon pass away. In other words, the serum begins and the culture perfects the immunity.

Turning to the practical aspect of serum therapy let us see what has been done to make it available in the treatment of diphtheria. And first of all how should we look upon the character of its therapeutic action from the experimental point of view? Whatever may prove to be the truth concerning the relation between toxin and antitoxin, this much seems to be put beyond doubt by the experimental basis of the work, that the remedy contained in the serum is nothing more than nature's remedy manufactured under artificial compulsion by the horse, and transferred by the ingenuity of man to the body of the feeble child. The serum simply augments the forces of resistance without adding any that are unknown to or radically different from those in the human body. The curative action must therefore proceed along the very paths followed by the human body in a spontaneous recovery. No unusual symptoms, no miraculous change should be looked for, nothing beyond a quickening or acceleration of the favorable course. It is this fact which will make a true estimate of the remedy in many cases a difficult one.

The preparation of the antitoxic serum, as conducted at present, consists in the immunization of horses towards the toxin of diphtheria and the use of their blood serum for purposes of protection and cure upon the human body. So much has been written upon this part of the subject that I may be very brief. To obtain antitoxic serum, sheep, goats and dogs were at first used, also cattle; finally horses. The process of immunization has not yet fully emerged from the experimental stage. Horses have been immunized by beginning with injections of small doses of young cultures of the diphtheria bacillus and increasing the dose gradually; by using this bouillon culture freed from the bacilli by sedimentation or filtration, and mixed at first with a certain quantity of iodine solution, or of iodine trichloride to mitigate the toxin. Cultures have also been heated to a temperature of 65° C. in the beginning to reduce the force of the toxin. These injections have been made into the subcutis, or into the veins, in small repeated doses, or in large doses at longer intervals. All these processes appear to lead to the same result eventually, that of gradually raising the antitoxic power of the serum to a certain maximum level beyond which it seems difficult to pass. After a series of injections lasting at least six months, blood is drawn from a jugular vein with aseptic precautions,

allowed to coagulate and the serum drawn off. The immunization and bleeding are kept up indefinitely as long as the horse remains in good health and is capable of keeping the antitoxic power of his blood above a certain level. The serum is mixed with enough carbolic acid by Behring to give it the strength of a one-half per cent solution. The object of this is to keep any adventitious bacteria or molds which may have gained access to the serum from multiplying. Roux uses a little camphor, Aronson, who directs the manufacture of Schering's antitoxin, uses 0.4 per cent tri-kresol.

The serum prepared under Behring's supervision is sent out in three grades. Of the lowest grade, No. 1, each cubic centimeter contains about 60 immunity units, and 10 c. c. contains 600 units. This grade is used more particularly for protecting children who are exposed to diphtheria. Behring considers 150 units, or about $2\frac{1}{2}$ c. c. of the serum enough for this purpose. Latterly it has been suggested by him that less serum of a greater strength is better adapted than No. 1 for immunization, as it is less likely to prove annoying to children than a larger quantity. The second grade, No. 2, is about 10 times the strength of the normal serum, and each c. c. contains 100 units. Of this 10 c. c., or 1,000 units are now injected as soon as the disease has been recognized, and on succeeding days as much more of this grade, or of No. 1, as may be necessary. The third grade, No. 3, is about 15 times the strength of the normal serum, and each c. c. contains 150 units, 10 c. c. 1,500 units. It is used only in serious cases and in those for which early treatment was impossible.*

The French are employing chiefly a serum of the grade of No. 1. Hence larger quantities must be used. Twenty c. c. of serum is said to be the smallest quantity injected, while in severe cases as much as 80 or 90 c. c. has been administered. It is evident from what has been said thus far, that the higher the strength of the serum, the greater the expense involved in obtaining it, owing to the danger connected with the injection of very large quantities of toxin into horses and the longer period of treatment necessary. Thus 600 units contained in No. 1 are actually cheaper than 600 units in No. 2. This would mean that it is cheaper to inject 20 c. c. of a lower grade of serum than 10 c. c. of a higher grade, both containing the same total number of units. The serum is injected into the subcutis with a special syringe which can be thoroughly sterilized and made aseptic. The place of inoculation, as well as the hands of the operator must be disinfected. The precautions are essential by reason of the peculiar nature of the serum and the relatively large quantities injected.

The two great obstacles to the efficiency of the curative serum are tardy application and mixed infections. As to the first obstacle, this was foreshadowed in the very beginning of the experimental researches, when it was discovered that the amount of serum required to save a diseased animal rose in almost geometrical progression with the time which had elapsed since the infection. This is, therefore, a difficulty experimentally demonstrated,

* Schering, of Berlin, is placing upon the market an antitoxic serum which according to the various tests which have been made, is equivalent to Behring's No. 2. It is in fact claimed to be somewhat stronger than this. It contains tri-kresol instead of carbolic acid. Aronson, who has charge of the manufacture, recommends the injection of but 5 c. c., or about 600 units.

unavoidable from the very nature of infectious diseases, and always to be reckoned with. The second obstacle, the association of streptococci and other pyogenic or septic organisms with the diphtheria bacilli appears to be not uncommon. It is probable that the latter are in most cases to blame for the beginning of the disease, while the former change the type of the malady and make it more serious in character. According to some experiments of Roux, rabbits inoculated into the trachea with diphtheria bacilli and streptococci failed to show even retardation of the fatal issue, when three times the amount of serum was injected which would have saved a rabbit inoculated in the same manner with diphtheria bacilli only. The importance of streptococci is probably not nearly so great in the human subject as in these experimental animals, yet the presence of virulent varieties may greatly hinder the efficacy of the serum, besides tending towards broncho-pneumonia and the formation of other internal foci of disease. In spite of these drawbacks the favorable results following the use of the antitoxic serum in the treatment of diphtheria have been reported from many quarters, and they are undoubtedly familiar to you all. Any quotation of the statistics which have been presented by the medical journals would be superfluous on my part. There are a few points, however, upon which you as physicians should concentrate your attention in order that the true place for this new remedy may be speedily determined. All cases of supposed diphtheria treated with antitoxin should be diagnosed bacteriologically and studied clinically with the greatest care. Besides noting the extent of the local disease and the severity of the constitutional disturbance, you should pay special attention to the condition of the kidneys which, as has been claimed in some quarters and denied in others, may be injured by the treatment. Furthermore, the appearance of any severe skin and joint affections which have been described by some as following the injection of the antitoxic serum should be carefully studied. Again, the reappearance of the disease after an apparent cure, and mild relapses may be occasionally expected from the very nature of the passive immunity induced by the serum.

It is likewise of importance to settle the question as to the advantages or disadvantages following any local treatment during the administration of the curative serum. While some caution against any local interference as useless, other authorities urge the local treatment as highly desirable or even necessary in combination with the serum. Unfortunately, theoretical deductions do not furnish us any guide, and the question is one upon which the physician must finally speak the last word. The large amount of carbolic acid which must be injected with the serum when Behring's is used, amounting in 10 c. c. of serum to 0.05 of a gram. of this substance, or to about $\frac{3}{4}$ of a grain, has also been objected to by some authorities as poisonous to the system of the child. Other equally reliable authorities have been unable to detect it in the urine or to ascribe to it any noticeable action.

To state more than this upon the practical application of the antitoxic serum would be overstepping my limits. The case now rests with you, as it has passed beyond the experimental stage. The numerous trials made by competent medical authorities, and the general consensus of opinion as to its favorable action, should remove all hesitancy which you may have entertained towards its unrestricted use.

It would be manifestly unjust to many investigators if I passed by the many interesting facts which have been discovered in relation to the blood serum in other infectious diseases. The work on diphtheria, having culminated in a practical method for the prevention and cure of diphtheria, deserves, naturally enough, the most important place in a lecture of this character. There are, however, other buds and blossoms on this tree of serum therapy which may ripen into good fruit, if not at once, certainly in due time.

The investigations of another toxic disease, tetanus, have already been mentioned as the means of the discovery of the preventive and curative action of blood serum. The whole character of this disease presents such strong analogies with that of diphtheria that I need not refer to it in detail. Curiously enough, serum therapy is less successful here than in diphtheria. The difficulty seems to lie in the enormous amount of antitoxic serum required to check the disease already under way when compared with the minute quantity needed to prevent the disease.

The large amount of experimental work which has been devoted to these two toxic diseases has brought to light some very interesting facts. Among these, the presence of antitoxin in other body fluids besides the blood deserves our attention. The antitoxic substance has been found in the secretions and excretions of the protected animal. The milk contains a considerable quantity of it. The remarkable influence exerted by the milk in immunizing and curing the suckling young of animals has been most admirably worked out by Ehrlich and by others associated with him. To illustrate the indestructibility of the antitoxic substance, I may be permitted to quote the following experiment from Ehrlich. A white mouse received on the seventeenth day of lactation 2 c. c. of serum from a treated horse, of which 0.003 c. c. was sufficient to protect a mouse inoculated with a splinter of wood dipped into a tetanus culture. On the following day another dose of 2 c. c. was injected. Just before the second injection a suckling mouse was inoculated under the skin of the back with an infected particle of wood. Though a larger control mouse inoculated in the same manner died of tetanus in 26 hours, this suckling mouse was not affected. In another experiment, a mouse already showing signs of tetanus was placed with an immune nurse, and the tetanic symptoms disappeared after a few days. The first experiment shows that the antitoxin in the horse's serum passed into the milk within 24 hours in sufficient quantity to protect a mouse feeding on it from a fatal inoculation. To demonstrate the diphtheria antitoxin in the milk, hornless goats were immunized by the injection of sterilized diphtheria cultures and of the diphtheria toxin. By examining at different intervals both the serum and the milk of the same animal the relative amount of antitoxin could be readily measured. The ratio of the antitoxin in the serum to that in the milk fluctuated between 15 to 1 and 30 to 1. This difference is easily comprehended by recalling the fact that the blood is probably the source of the antitoxin found in the milk. Latterly this substance has been separated from the milk by Brieger, who precipitated it from the whey by magnesium sulphate. Enough has been said of this phase of the antitoxin studies to make us realize the importance of the process of lactation upon the human race. Ehrlich traces the immunity enjoyed by the suckling infant from various diseases to the protective substances secreted in

the mother's milk, and points to the total loss of this protective function in the now too prevalent artificial feeding of infants.

Before leaving the subject of antitoxic serum, a brief reference to the analogy existing among vegetable poisons, animal poisons and bacterial poisons will tend to show how firmly the principles of the antitoxic power of blood serum are founded. Ehrlich, in 1891, demonstrated in a very instructive series of experiments, that the poisons, or toxalbumins, which may be extracted from the castor and the jequirity bean and named, respectively, ricin and abrin, are also neutralized by the blood serum of properly immunized animals. The extremely fatal action of ricin is signalized by the fact that 0.7 c. c. of a 1-1,500,000 solution was fatal to guinea pigs. For white mice the fatal doses fluctuated between a 1-200,000 solution and a 1-750,000 solution given in the uniform dose of 1 c. c. Ehrlich produced immunity in white mice by feeding extremely small quantities at first (.002 grams), and gradually increasing the dose. When 0.1 gram was reached the immunization was continued by subcutaneous injections. By this tedious process the immunity was increased to such a degree that the treated animal could stand from 200 to 800 times the originally fatal dose. The eye, ordinarily destroyed by the application of a minute quantity, could resist without any reaction the application of thick pastes of the poison. When the blood of such highly protected mice was mixed with five times the fatal dose and the mixture injected into other mice no effect was produced. The same procedure furnished Ehrlich with mice highly immune to the toxalbumin of abrin. The very severe effect exerted by this substance on the eyes was entirely eliminated in these immunized mice. The blood also contained an antitoxin capable of neutralizing a certain amount of abrin. This was furthermore detected in the milk. Young mice born of unprotected mothers were placed with protected mice acting as nurses. These were thereby made insusceptible to several times the fatal dose of ricin or abrin. The immunity lasted during the period of lactation, and slowly disappeared afterward. The most unexpected fact was brought out by treating abrin-immune mice with ricin and vice versa. In spite of the very close relation between these poisons, the abrin-immune mouse succumbed to ricin and the ricin-immune mouse to abrin, as if neither had been treated.

Calmette in experimenting with the poison of serpents has shown that when immunity has been conferred against this toxalbumin, the blood serum of the vaccinated animal possesses antitoxic powers similar to those of diphtheria-immune and ricin-immune animals. When such blood serum is mixed with snake-poison in a certain proportion, the mixture manifests no poisonous properties after infection.

Leaving the toxic diseases, we come to the infectious diseases which are characterized by the multiplication of the specific disease germs within the body, rather than by an absorption of toxin from some local external focus of disease.

Among these, Asiatic cholera* has received most attention, and some very important facts elicited, which are, however, of little more than theoretical interest at present. If we compare the action of the serum of guinea-pigs immunized towards the cholera vibrio and that of guinea-pigs immunized

* This disease, strictly speaking, stands between the toxic and the infectious diseases.

towards diphtheria or tetanus, certain fundamental differences appear. When guinea-pigs receive a certain dose of the cholera vibrio into the peritoneal cavity, they die within twenty-four or thirty-six hours. Vibrios are found in the peritoneal cavity and in the intestine after death. When such animals are treated in the same way, especially with cultures of the same vibrio sterilized by heat at 65° C. they become insusceptible to a fatal dose of the living microbe. A little of their blood or blood serum injected into a guinea-pig twenty-four hours before a fatal dose of the vibrio is applied, protects that guinea-pig from that fatal dose. The serum of such guinea-pigs is thus distinctly protective. When such serum is mixed with living cholera vibrios, the latter are gradually destroyed, so that in from three to six hours after the time of mixing, all the vibrios may be dead. When the serum of untreated or susceptible guinea-pigs is tested in the same way, no destruction of vibrios but rather prompt increase, is observed. The blood of the protected guinea-pig contains a bacteria-destroying, or a bactericidal substance which is not present in the blood of the normal guinea-pig. Whether this bactericidal substance is identical with the immunizing substance or only a part of it, is not clear for it has been found by C. Fränkel that even after this protective serum has been made to forfeit its bactericidal properties by an exposure to 70° C. it is still capable of protecting a guinea-pig into which it is injected.

To add to the complexity of the problem, it has been determined that immunity cannot be conferred by any method towards infection by the mouth, but only towards intra-abdominal inoculation. The climax of discouragement is capped when we must admit that no amount of protective serum is capable of arresting the disease in guinea-pigs after it has once been set in motion. In other words, a curative or therapeutic action is absent. The action of the protective serum seems thus to be directed, not towards the destruction of any poison as in diphtheria, but towards the destruction of the vibrio itself. This seems to be an easy matter when the serum is injected first. When the vibrios are injected first their rapid multiplication renders any bactericidal action powerless.

A true protective substance has been demonstrated to exist in the blood of human beings who have passed through an attack of cholera. It appears several weeks after convalescence, later and in greater concentration in the more severe cases. Only recently the bactericidal and protective action of blood serum has been made use of in the diagnosis of vibrios found in river water in infected countries. Those vibrios which resist the protective serum within the body of the guinea-pig are regarded as not identical with the true cholera vibrio. If this serum test should prove to be reliable, it would be a great aid in the etiological study of this still mysterious disease.

Of other diseases in which a protective substance has been demonstrated to appear in the blood after immunity, are rabbit septicæmia, mouse septicæmia or swine erysipelas, and sputum septicæmia in rabbits caused by the *diplococcus lanceolatus*.* Furthermore, the blood of animals made insusceptible to rabies confers protection upon bitten animals. This discovery may revolutionize the present antirabic treatment.

*Sternberg in 1872 showed that vaccinia virus was neutralized by immersion in the blood serum of a vaccinated calf.

The specific nature of the immunity conferred by the products of bacterial growth and by vegetable poisons, and the specific action of the antitoxin developed in the blood of such protected animals are in themselves very striking phenomena. The white mouse, protected against 200 times the fatal dose of ricin, is still as susceptible towards the very closely related abrin as a normal mouse. The guinea-pig, made proof against many times the fatal dose of the tetanus poison, remains unchanged towards the diphtheria toxin. Again, the serum of the guinea-pig, rendered immune to the Asiatic cholera vibrio, has no bactericide power towards other closely related vibrios. The phenomena of the specific nature of infectious diseases has been known to the medical profession for a long time. That this specific nature should maintain itself in the protective substances manufactured in the body, in the antitoxins and in the bactericidal substances, was hardly to be anticipated. But the demarcation between these poisons when viewed with reference to their respective antitoxins, has been shown by Roux and his co-laborers to be not so sharp as the illustrations I have given would make us believe. Nature is full of tints and shades and gradations. No sooner has the investigator come upon a sharp contrast and begun to rejoice that his labels are not likely to become mixed after he shall have classified and put away his facts, than he finds to his dismay that connecting links, intermediate forms, gradations or whatever else you may call them, begin to appear to warn him that he is still on the surface of his subject and that he must begin his labors anew.

It has been found that the serum of rabbits which have been vaccinated against rabies possesses decided antitoxic power towards the poison of serpents. A rabbit rendered immune towards rabies is at the same time made refractory towards four or five times the fatal dose of snake poison. Similarly, the serum of horses rendered insusceptible to tetanus, neutralizes the poison of the cobra. The antitoxin which appears in the blood of animals made insusceptible to snake poison, has some effect upon the abrin poison, while the anti-abrin serum has also some effect upon the venoms. This interaction of toxins and antitoxins is used with much effect by Roux in advocating the theory that the antitoxic or other protective substances which appear in the blood do not act directly upon the toxins or the invading bacteria, but exert a stimulating influence upon the body cells, which in their turn create or act as the real weapons of defense.

From the brief sketch which I have given you will perceive at once that any predictions concerning the undeveloped possibilities of serum therapy would only reflect the ignorance or the egotism of the would-be prophet. Each disease presents to us a series of difficult problems peculiar to itself, which must be overcome before the hope of any practical results may be entertained. A consideration of the widely divergent activity of the blood serum of vaccinated animals in diphtheria and in Asiatic cholera, for example, is a sufficient warning for us to avoid hasty generalizations. The benefit to be derived from studies of the blood in different diseases will probably appear from unexpected directions. All that I need urge here is a hearty material support of experimental research in all branches of medical science.

In conclusion, it appears to me that the most thoroughly educated, the most progressive physicians can not but receive with pleasure and satisfaction this

new remedy, because it is Nature's remedy. In all departments of scientific research designed to promote man's welfare, the conviction has entered the minds of men that the forces of Nature herself must be sought out and subjugated in order that we may overcome the difficulties which beset the race at every onward step. Even the tillers of the soil no longer look for miracles but laboriously try to placate Nature by obeying the rules of a scientific agriculture. But practical medicine is still somewhat behind. A long queue of empiricism is still dangling from an otherwise distinguished crown. Thanks to the labors of medical science, this queue is being shortened year by year. A new era is dawning in which the healing art shall endeavor to possess herself of Nature's methods and Nature's forces in the cure of disease and in which no efforts will be spared to further the work that is probing for the source of these natural forces. Serum-therapy is one of the most important steps taken in this new direction in recent years and while many of the older physicians may shake their heads and pass on to their graves sceptical and unconverted, the younger generations, who have witnessed the growth of the new alchemy in the laboratories of regenerated medical schools may be depended upon never to set their faces backward, but to push on, abreast with the other sciences in the human conquest of Nature.

At the conclusion of Dr. Smith's lecture, on motion of Dr. Vander Veer, the thanks of the association were, by a rising vote, tendered to Dr. Smith for his able and interesting address.

COMMENCEMENT EXERCISES.

The sixty-fourth annual commencement exercises of the Albany Medical College were held at Harmanus Bleecker Hall, on Tuesday afternoon, April 16, 1895, at 3 o'clock, in the presence of a large audience. Dr. A. V. V. Raymond, president of Union University, presided, and upon the stage were seated the members of the faculty, officers of the Alumni association and prominent citizens. The following was the order of exercises:

OVERTURE—"Gleanings,"	- - - - -	<i>Beyer</i>
PRAYER,	- - - - -	Rev. CHARLES E. DUNN
MUSIC—Selection; "Cavalleria Rusticana,"	- - - - -	<i>Mascagni</i>
ESSAY,	- - - - -	FRANK GALE HYDE
MUSIC—Intermezzo; "Danse Antique,"	- - - - -	<i>Hume</i>
CONFERRING DEGREES,	By ANDREW VAN VRANKEN RAYMOND, D. D., LL. D., President of Union University.	
MUSIC—Cornet Solo; Selected,	- - - - -	Mr. R. B. HALL
ADDRESS,	- - - - -	Rev. WILLIAM FORCE WHITAKER, Albany
MUSIC—"Hungarian Dance,"	- - - - -	<i>Hume</i>
VALEDICTORY,	- - - - -	RICHARD LLEWELLYN STODDARD
MUSIC—Waltz; "Happy Thoughts,"	- - - - -	<i>Neumüller</i>
REPORT ON PRIZES AND APPOINTMENTS,	- - - - -	Prof. HENRY HUN, M. D.
BENEDICTION.		
MUSIC—March; "Directorate,"	- - - - -	<i>Sousa</i>

The graduating class was as follows:

JOHN MARBLE ALLEN,	- - - - -	Madison, N. Y.
EDWIN VAN GAASBEEK BALDWIN,	- - - - -	Albany, N. Y.
WILLIAM SAMUEL BRISTOL,	- - - - -	Lacona, N. Y.
ARCHIBALD BUCHANAN, Jr.,	- - - - -	Troy, N. Y.
CHARLES SYLVESTER BUTLER,	- - - - -	Ouaquaga, N. Y.
THOMAS MICHAEL CLARKE,	- - - - -	Springfield, Mass.
FREDERICK WILLIAM CORDES,	- - - - -	Hoosick Falls, N. Y.
FRANCIS JOSEPH CRUMMEY, B. S.,	- - - - -	Albany, N. Y.
ALFRED DESROCHERS,	- - - - -	St. Jacques, Canada.
DANIEL DAMIAN DONOVAN,	- - - - -	Troy, N. Y.
CHARLES GARTNER, Ph. G.,	- - - - -	West Troy, N. Y.
ARCHIBALD GILBERT, Ph. G.,	- - - - -	Albany, N. Y.
HARRY DU BOIS GOETCHIUS,	- - - - -	Poughkeepsie, N. Y.
SHERWOOD ACKLER HAGGERTY,	- - - - -	Litchfield, N. Y.
DORR WILLIAM HARDY,	- - - - -	Worcester, N. Y.
FRANK HAZELETT HURST,	- - - - -	Albany, N. Y.
FRANK GALE HYDE,	- - - - -	Troy, N. Y.
ARTHUR MANY JOHNSON,	- - - - -	Binghamton, N. Y.
THOMAS BASSETT KEYES,	- - - - -	Oneonta, N. Y.
DURAND REED KINLOCH,	- - - - -	Troy, N. Y.
EVERETT STARKE KINLOCH,	- - - - -	Troy, N. Y.
ADELARD LAURION,	- - - - -	Joliette, P. Q.
LOUIS OSCAR LE SIEUR,	- - - - -	Gentilly, Canada.
JAMES PETER McGRATH, Ph. G.,	- - - - -	Albany, N. Y.
EDWARD NORRIS KIRK MEARS, B. A.,	- - - - -	Albany, N. Y.
HOWARD WILLIAM MURPHY, Ph. B.,	- - - - -	Albany, N. Y.
CHARLES LEONARD MYERS,	- - - - -	Rome, N. Y.
SAMUEL PASHLEY,	- - - - -	South Hartwick, N. Y.
EDWARD FERGUSON PICKFORD, B. A.,	- - - - -	Schenectady, N. Y.
LEE PULTZ,	- - - - -	Stanfordville, N. Y.
WALTER KENDRICK QUACKENBUSH,	- - - - -	Waterford, N. Y.
WILLIAM MONROE RAPP,	- - - - -	Albany, N. Y.
FRED JOHN RESSEGUIE,	- - - - -	Northville, N. Y.
ARTHUR THAYER ROBINSON,	- - - - -	Monson, Mass.
FRED SAUERBRIE,	- - - - -	Clarksville, N. Y.
REED ALONZO SAUTER, Ph. G.,	- - - - -	Schenectady, N. Y.
DANIEL JOSEPH SHAY,	- - - - -	Saratoga Springs, N. Y.
LEONARD GOVE STANLEY,	- - - - -	West Troy, N. Y.
RICHARD LLEWELLYN STODDARD,	- - - - -	Lowville, N. Y.
HAROLD BISHOP STOWELL,	- - - - -	Watertown, N. Y.
HERBERT NICHOLS TANNER,	- - - - -	Lebanon Springs, N. Y.
CHARLES RODMAN TOWNSEND,	- - - - -	Lansingburgh, N. Y.
CHARLES HAVERLY TURNER,	- - - - -	Berne, N. Y.
RICHARD FLETCHER VAN HEUSEN,	- - - - -	Albany, N. Y.
WILLIAM JAMES WANSBORO,	- - - - -	Albany, N. Y.
CHARLES EDWARD WEIDMAN,	- - - - -	Gallupville, N. Y.
JOHN ARCHIBALD WILDER,	- - - - -	Hoosick Falls, N. Y.

Dr. Hun presented the prizes. The prize offered by Dr. Vander Veer, for the best report of the surgical clinics, was awarded to Dr. Fred Sauerbrie, and the prize offered by Drs. Hailes and Morrow, for the second best report of these clinics, was awarded to Dr. William M. Rapp.

The prize, consisting of an ophthalmoscope, offered by Dr. Merrill, for the best report of the eye and ear clinics, was awarded to Dr. Frank G. Hyde.

The prize offered by Dr. Townsend, to the student passing the best examination in physiology at the end of his first year of study, was awarded to John W. Travell.

Dr. Boyd's prize, to the student passing the best final examination in obstetrics, was awarded to Dr. Everett S. Kinloch.

The prize, consisting of a case of surgical instruments, offered to the senior student passing the best final examination, by Dr. T. W. Nellis, was awarded to Dr. Everett S. Kinloch.

The prize offered by Dr. H. R. Powell, to the second year student passing the best final examination, consisting of a general operating case, was awarded to Jesse M. W. Scott.

A prize, consisting of Gross' complete pocket case of instruments, offered by A. B. Husted & Co., to the first year student passing the best final examination, was awarded to Reuben H. Irish.

At the competitive examination for hospital positions, the following appointments had been made: Albany hospital, Drs. Reed A. Sauter, Fred J. Resseguie and Frank H. Hurst; St. Peter's hospital, Drs. Howard W. Murphy and John A. Wilder; Ellis hospital, Schenectady, Dr. John M. Ailen. Dr. Hun also announced that after competitive examination, Dr. Richard F. Van Heusen had been appointed to the house staff of Charity hospital, and Dr. Harry D. Goetchius to the house staff of the Maternity hospital, in New York city.

ALUMNI BANQUET.

The twenty-second annual banquet of the Alumni association was held on Tuesday evening, April 16, 1895, at half past eight o'clock, in the large hall of the new Odd Fellows' temple. About one hundred and seventy were present, including members of the association, their guests and members of the class of '95. Holding's orchestra stationed in the gallery, rendered orchestral selec-

tions during the evening, and the usual Alumni songs were sung. The banquet was served in courses as follows:

Creamed Oysters and Chicken Salad.
Finger Breads.
Chicken Croquettes with Green Peas.
Salmon Chops. Sandwiches.
Roman Punch.
Patties of Sweetbreads. Clam Croquettes.
Neapolitan Ice Cream.
Fancy Cake.
Coffee. Cigars.

Dr. Van Vranken acted as toastmaster, and the following toasts were responded to:

1. "Our Alumni Association," Dr. William Hailes.
2. "Union University," President A. V. V. Raymond.
3. "The Faculty," Dr. Samuel B. Ward.
4. "Our Law-makers," Senator Amasa J. Parker.
5. "The Legal Profession," Hon. Eugene Burlingame.
6. "The Clergy," Rev. Dr. J. F. Elder.
7. "The Orator of the Day," Rev. William F. Whitaker.
8. "The Class of '95," Dr. Daniel J. Shay.

The "Parting Ode" was then sung to the tune of "Auld Lang Syne," and President Van Vranken in a few remarks, declared the reunion of '95 at an end.

Average Duration of Life among Physicians.—A curious statistical record has been compiled by Dr. Salzmann, of Essling, Wurtemberg, on the average duration of life among physicians. He found, in going over the ancient records of the kingdom, that in the sixteenth century the average duration of life among that class was but 36.5 years; in the seventeenth century, 45.8; in the eighteenth, 49.8; and at the present time they reach the favorable average of 56.7. It appears from the foot notes to the above that this very great increase in longevity is due to the disappearance of the "Black Pest," the introduction of vaccination, and the great diminution in the number of typhus epidemics, three classes of diseases formerly the especial scourges of medical practitioners.—*Medical Record*.

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THE ADULTERATION OF DRUGS.*

BY WILLIS G. TUCKER, M. D., PH. D., ALBANY, N. Y.

Pure air to breathe, and pure food and water to eat and drink, are perhaps in a sense, matters of more importance to the community than pure drugs to use in sickness, because the normal condition of the body is health, and if this be maintained by respecting the laws of nature, and living well-ordered lives amid sanitary surroundings, we shall have little need of medicine, but, unfortunately, many of us do not respect these laws, or we are unwilling or unable to live in a healthful environment. Through hereditary influences, moreover, for the which we are in no wise responsible, many of us come into the world badly handicapped in the matter of health, and, hence, as a result of unwise living, bad surroundings or natural taint, we fall a prey to disease and need the physician's aid. Hold what view we may as to the real efficacy of the medicines which he administers, the great majority of us take more or less of them in the course of our lives, and when we *do* take them we are naturally desirous that they be pure and properly compounded. Absolute purity or precise strength may not in all cases be matters of supreme importance, but the feeling is not only natural, but entirely justifiable, that, if medicine is in any sense a science, the medicinal agents employed in the treatment of disease should be administered with some approach to scientific

*A lecture delivered before the Brooklyn Institute, May 24, 1895.

precision. Looked at in this light, therefore, nothing is unimportant, and the pharmacist who would be the true ally of the ideal physician must take this view of his calling and practice it as a profession and not as a trade. In other words, he, no less than the physician, must be imbued with the scientific spirit, and regard accuracy and precision in the practice of his art as of no less importance than business integrity in the conduct of his affairs.

The first question that we may well ask is: What constitutes adulteration? Our latest dictionary, the "Standard," says that to adulterate is to "make impure by the admixture of other, or baser, ingredients," and this definition is practically the same as that given by most other lexicographers, and it is the meaning which we ordinarily attach to the term. But the word as used in our statutes, and by analysts, has a much broader, and often a very different significance. A great many articles *are* intentionally debased by the addition of cheap make-weights with fraudulent intent. Thus, among foods, for example, glucose is added to maple syrup; starch and gypsum to cheap confectionery; roasted cereals to ground coffee, and all sorts of rubbish to ground spices, but of this kind of adulteration, there is, according to my experience, comparatively little in the manufacture and preparation of drugs. The adulteration of drugs does not generally consist in the direct and intentional addition of foreign material, but in the substitution of articles of inferior quality, or of inferior and sometimes of excessive strength. The "Public Health Law" of this state, being chapter 661 of the Laws of 1893, defines in section 41, article III, adulteration, in the case of drugs, as follows: "An article shall be deemed to be adulterated within the meaning of this act: 1. If when sold under or by a name recognized in the United States Pharmacopœia, it differs from the standard of strength, quality or purity laid down therein. 2. If when sold under or by a name not recognized by the United States Pharmacopœia, but which is found in some other pharmacopœia or standard work on materia medica, it differs materially from the standard of

strength, quality or purity laid down in such work. 3. If its strength or purity fall below the professed standard under which it is sold." Therefore if one article be substituted for another, as common safflower for crocus; or if an article, originally of good quality, has deteriorated by age or exposure, as may happen in the case of such articles as diluted hydrocyanic acid, ammonium carbonate, or magnesia; or if, owing to careless or improper manufacture, an article contains foreign matter, whether intentionally added or not, as alkaline carbonates in the bromides or iodides, or calcium sulphate in precipitated sulphur; or if it be deficient in strength, or of excessive strength, as is often the case with the diluted acids—then such an article is adulterated within the meaning of the act. It is well that this be distinctly understood, because the common opinion is that only those articles are adulterated which are intentionally debased, and that such adulteration is very common, whereas the fact is that such an adulteration of drugs is by no means extensively practiced. I do not say that it does not occur, but it is by no means as common as is generally supposed. The inferior drugs that are sold in our stores are for the most part inferior because articles of lower grade, perhaps not even included in the pharmacopœia, have been purchased because cheaper, or for the reason that they have been carelessly or ignorantly prepared or preserved, and not because of intentional admixture of foreign material, and it has taken pharmacists a long time to understand this matter and recognize the fact that they are responsible for the goods they dispense, and that it is their bounden duty to know the quality of the articles in which they deal. They cannot shift this responsibility to the manufacturer or the wholesaler. It is the business of the pharmacist to know the different grades of the articles which constitute his stock in trade; to select them with careful discrimination; to preserve them in a proper manner; to test their quality, if need be, and adjust their strength, when necessary, and to use due care in the preparation of such articles as he himself manufactures, so that they shall be of the quality and strength that the phar-

macopœia demands or established custom requires. In other words, the pharmacist should be a skilled workman and not a mere retailer of commodities. The public regard him as proficient in his particular calling and have a right to expect expert service when they present prescriptions for his compounding, and if he is satisfied to dispense whatever he buys from the maker or the wholesaler, without inquiry or warrant of any kind, or test of his own making, he has no right to claim the title of pharmacist, nor to charge for the materials he furnishes more than they are worth in bulk with a fair retailer's profit added thereto. The public are ready to pay and expect to pay him not only for the drugs he compounds, but for the skill employed in selecting, preparing, preserving and properly compounding them, and if this skill be lacking, they are defrauded and the imposition is the more culpable because the matter may be one in which health or even life is at stake.

This is perhaps not the place to discuss at any length the duties and responsibilities of the pharmacist, or the present condition of American pharmacy, but a few words upon some of these matters may not be out of place in this connection. We have said that the pharmacist should be imbued with the scientific spirit, and from the outset, he should be taught to regard his calling as a profession. It is unfortunate that he is at present, in a sense, required to combine with his legitimate trade in drugs, a trade in sundries, some of which are in no way related to his real business. There is no reason why he should deal in non-medicinal beverages and fancy goods like toilet articles, to say nothing of cigars, books and periodicals, and the odds and ends of all kinds, which, while adding to the volume of his trade, detract from the dignity of his legitimate calling and the proper conduct of his business. But so it is, at present, and all that he can perhaps do is to magnify in every proper way the importance of that part of his work which *is* legitimate, and minimize so far as he can that part of it, the very existence of which is to be regarded as an outgrowth or excrescence. If the necessi-

ties of the case require him to deal in such articles as have been named, let him at all events so arrange his store and dispose of his stock that they shall not occupy the place of prominence. There are some drug stores, the true nature of which it would be difficult to determine on a hasty inspection, were it not for the decorated jars and colored show-bottles which adorn the windows, or the gilded and illuminated mortar over the entrance, which serves as a sign by day and a beacon by night.

The outlook in some respects is discouraging, but influences are at work which we may hope will eventually raise the business of the druggist to the plane upon which it ought, from every right consideration, to be established, and among these may be mentioned the legislative action which has been taken, within recent years, in our own and in other states. We can not hope that legislation will accomplish any great reforms suddenly. Too much should not be expected from such action, as we shall presently more particularly point out, but the fact is by no means to be ignored that in forty-four of the states and territories we now have pharmacy laws, which, to some extent at least, regulate the sale of drugs and poisons, and prohibit adulteration, and these laws, though enforced with varying degrees of efficiency, have yet done something, and may be expected in the course of time to do more, to elevate American pharmacy and protect the public. The examination, registration and licensing of pharmacists, to the end that only those who have shown themselves capable shall be allowed to dispense medicines, is a step in the right direction, as are also definitions of adulteration and the legal establishment of standards.

Most of these pharmacy laws follow pretty closely the English statutes, and though in some cases their enactment has been opposed on the ground that they interfered with individual rights and unnecessarily hampered business, they are now pretty generally conceded to be right in principle, and on the whole, productive of fairly good results in practice. Professor Oldberg of Chicago has recently offered for consid-

eration and discussion a draft of a proposed pharmacy law in which provision is made for the licensing of stores of different grades, as follows: 1. Those under the management of a registered pharmacist in which poisons and potent remedies may be sold, to be known as pharmacies of the first class; 2. Those under the charge of a registered pharmacist, or assistant pharmacist, in which poisons and potent remedies shall not be permitted to be sold, to be known as pharmacies of the second class; 3. Those conducted by licensed druggists (as defined in the act) in which the preparation and compounding of medicines is prohibited, to be known as licensed drug-stores. The principle involved in this proposed legislation seems to me to be correct, but whether such a classification could be practically made and maintained I do not pretend to say. Be this as it may, the State is certainly coming to deal more definitely than ever before with the relations existing between its citizens, and many new laws regulating the practice of the professions and the conduct of many of the trades, have, during recent years, been enacted. Our pharmacy laws belong to this class, and it is all-important that pharmacists should understand the nature of the evolution which is taking place, and should conform to the new demands which are made upon them. Our colleges of pharmacy have no unimportant part to play in bringing about the reforms which are so greatly to be desired. They should not only impart scientific instruction, but they should explain the legal provisions which govern the practice of pharmacy and impress upon their students the fact that they occupy an important place in the community, and are, in a sense, public servants with well-defined and highly important duties to perform. In a state like ours, in which the duties and responsibilities of the pharmacist are, to a certain extent at least, defined, he can not plead ignorance of the law as an excuse for non-compliance with its requirements. With new responsibilities come new opportunities and new honors also, and he is lacking in proper self-respect and proper regard for the dignity of his calling if

he seeks to evade these responsibilities and prefers to fill the place of a tradesman rather than stand forth as a skilled workman in a scientific pursuit. And as the demands upon him are multiplied, so should his compensation be increased. His charges for services rendered should be proportional to the skill required of him, and to the investment of time and of money which he has made in preparing himself to serve the public properly and legitimately. May we not hope that the time is not far distant when "cut rate" drug stores will be no more; unfair competition a thing of the past; charlatanism of all kinds banished from this business, and the practice of pharmacy, conducted by educated men alone, raised to the place which it ought to occupy among scientific pursuits?

That many abuses exist at present is implied in what has been said, but for many of these, the pharmacist himself is by no means responsible. Manufacturers have flooded the market with proprietary preparations and quack nostrums of all kinds, and these things, many of them of no value, the pharmacist is expected to keep in stock. In this respect, he occupies a very uncomfortable position, for if he denounces them as frauds and refuses to keep them, trade goes elsewhere and seeks those who are less punctilious and less deserving, and if he continues to sell them he feels that he degrades his calling. Another class of manufacturers, the manufacturing chemists, have put upon the market a bewildering variety of pharmaceutical preparations, the sale of which is, in many cases, supposed to be made only upon the physician's prescription. These are frequently changed, and they are multiplied from day to day. The manufacturer sends his agent, who calls upon the physician in person, recommending his products and leaving samples for his use, and by this personal solicitation, combined with the generous distribution of samples and lavish advertising in the journals, his goods are pushed into prominence, and the pharmacist must carry them in his stock, often at great risk, and not infrequently at a loss, or lose his patronage. I shall not attempt to say how these abuses may be remedied, merely

suggesting that as a result of concerted action among druggists, which would be possible, if, as a class, they were better organized for the protection of their own interests, and with better legislation, perhaps, the sale of quack nostrums and cure-alls, at the least, might be greatly lessened if not largely suppressed. The other evil referred to, the multiplication of non-official pharmaceutical preparations, is one not so easy to deal with. Many of them are of great value and constitute welcome additions to our *materia medica*, but their name is legion, and no one, I take it, will affirm that we need them all. So rapidly, however, is their use increasing, that many physicians depend very largely upon them, and seldom write prescriptions in the true sense, in which recognized medicinal agents are, either singly or combined with each other, prescribed with special regard to the particular case under treatment. Instead of so doing, they use some laxative or alterative; some tonic or sedative; some febrifuge or stimulant, of the real nature and constituents of which they have often but a general and very hazy knowledge, kindly obliging the manufacturer by specifying so and so's make in the prescription. Now I maintain that this is very largely wrong, and that such a method of prescribing leads to many abuses and degrades medicine. It leads to the unauthorized duplication of prescriptions, and to the general use, and often gross abuse, of remedies which ought to be taken only upon a physician's advice, and it limits the need for trained pharmacists and takes from such, a large share of their legitimate business. The sale of tablets, which has grown to such proportions of late, illustrates my meaning. Reputable physicians tell me that they find themselves, almost against their will, prescribing combinations of remedies in this form in a manner almost as arbitrary as if they ordered the use of somebody's purgative pellets, anti-neuralgic pills, or sedative elixir. They are so convenient to dispense or prescribe that they are led to abandon the use of standard preparations, and in their stead, dole out these handsomely prepared and often highly ornamental discs, the

composition of which they often forget and perhaps never have known. And their patients know them by name, get them in quantity, use them *ad libitum* and recommend them to their friends as occasion seems to require.

For abuses of this kind, physicians are themselves to blame and not the pharmacists, and it seems to me high time that this matter received the attention which its importance demands. If medicine is a science, and pharmacy, at the least an art, is it not time that the physician returned to a more rational method in the treatment of his cases? If not, he might as well abandon the study of materia medica and pharmacology; fill his case with empirical remedies, and admit that he has little use for the services of the educated pharmacist. But I trust that he will be reluctant so to do, and I look for an agitation of this matter which will lead to an abandonment of many of the preparations he now employs and a return to a more rational method of treatment. This is a matter which physicians and pharmacists may well consider together.

The New York State Board of Health was created by legislative enactment in 1880, and prior to that time there had been little legislation in this state on the subject of food adulteration, and practically none at all relating to drugs. In 1881 "an act to prevent the adulteration of food and drugs" was passed, being chapter 407, and it was made the duty of the State Board of Health "to take cognizance of the interests of the public as it relates to the sale of food and drugs and the adulterations of the same, and make all necessary investigations and inquiries relating thereto." Under this statute the Board appointed ten analysts to whom were entrusted investigations along different lines and voluminous reports were made by these analysts and printed in the second annual report of the Board. At a later date the number of analysts was reduced, and in 1891 the State Board of Health Laboratory was established and the entire chemical work of the Board was placed in the hands of the present director. Having been connected with this work from the outset, I have

had occasion to examine a very large number of samples of drugs, more than 10,000 in all, and as these samples have been collected in almost all parts of the state and represent a wide variety of articles, it is possible that some of the results obtained may be of interest if briefly stated.

The term "drug" as used in the statute referred to includes "all remedies for external and internal use," and the public health law of 1893, which repealed the law of 1881, gives a similar definition. The work which has been done by the State Board, however, has been confined almost exclusively to the examination of pharmacopœial articles, and the more especially as the pharmacopœia is recognized as an authoritative work, both by custom and legal enactment, and that we have in this work a definite standard of strength, quality or purity, for most of the articles included therein.

During the years 1891-1894 inclusive, 8,305 samples of drugs, chiefly pharmacopœial, were examined. Attention will presently be called to some of these, but, in a general way, it may be said at the outset that the object of the work has been not the determination of the proportion of adulterated to pure drugs as found upon the market, but the exposure of actual adulteration, substitution, sophistication and carelessness in the preparation of common drugs and pharmacopœial compounds; the warning of dealers and the publication of the results of the examination of samples obtained from them, and the information of the public. Therefore, no attempt has been made to collect a wide variety of articles, and such as are known to be seldom adulterated or of inferior quality, have not been collected, but such substances have been selected as would best test the knowledge, accuracy and integrity of the dealer. In the collection of samples, in every instance, the collector has tendered a written order, and this order has given the official names of the articles called for and the amount desired.

Now, the results of the examination of these 8,305 samples will, at first sight, be surprising. Of the total number, but 47.4 per cent could fairly be rated as of good quality; 14.8

per cent were of fair quality; 29.6 per cent were inferior; 4.4 per cent were of excessive strength, and 3.8 per cent consisted of articles wrongly sold, or not as called for. These percentages, however, by no means represent the proportions of good, bad or indifferent drugs on the market and on sale at the stores, since only those articles which were considered likely to be adulterated or known to be frequently of inferior quality, were collected. Had samples of drugs and pharmaceutical preparations been selected at random, the proportion of pure and good articles would have been very much larger.

Concerning the above classification or rating of the samples examined, it may be said that in the case of those articles in which the pharmacopœia establishes a definite standard of strength, as for instance in the case of the diluted acids, like hydrocyanic or hydrobromic, then an article must be either good or bad according as it does or does not conform to this standard, but such a method of rating would be manifestly unjust. It is not to be expected that medicinal articles can be prepared with the same precision that a chemist would employ in the making of a standard solution, and we therefore allow for some variation within reasonable limits. In our reports, samples are classed as of "good quality" when they fulfill the requirements of the United States Pharmacopœia or vary from the same only in some unimportant respect; of "fair quality," if, while not fully up to the pharmacopœial standard, they are evidently neither intentionally adulterated nor decidedly below such standard, and of "inferior quality," if clearly adulterated or falsified, lacking in any important constituent, deficient in strength from improper manufacture, partial or complete decomposition or other causes, or containing an undue amount of impurity. In some cases, through ignorance or intent, a wrong article is sold or some inferior article of a nature similar to that called for is substituted, and such samples are classed under the head of "not as called for." Articles like the diluted acids, possessing excessive strength, are classed under that head.

(To be Continued.)

*HAEMORRHOIDS.

Mr. President and Gentlemen :—I wish to thank you for the kind invitation which I received, through Dr. Kniskern, to read a paper before your society to-night. Although my paper is upon a subject in which I am particularly interested, I trust I may bring out some points in the treatment of piles which may be of interest to you all.

The word hæmorrhoids, the title of this paper, is rather misleading; but is now generally understood to mean more than simply a vascular tumor. The word comes from the two Greek words, “*aima*” blood, and “*reopew*” I flow, and if we confine ourselves to the meaning of the word, it would simply mean a varicose tumor. By ancient writers it was applied to any hemorrhage, whatever its site, while others used the term to mean a bleeding from the anus from any cause. By Hippocrates the term was held to include varices of the extremities of the hæmorrhoidal veins as appears by the following passage translated by Bodenhamer: “A defluxion of bile, or of pituitous matter, to the veins of the anus inflames the blood which those veins contain. The veins themselves being inflamed attract the blood of the others near them, and being filled with it, raise and swell the internal parts of the rectum. The little heads of the veins are then conspicuous, and partly from the pressure of the fæces, and partly from their own fullness, are liable to break and emit blood, particularly at the time of dejections.”

To-day the term is so universally applied to vascular, or other small tumors of the rectum, it would be impossible to make any change, at the same time the word as implying a symptom not always present is objectionable. Piles (from *pila*, a ball or swelling) is, as implying no theory or symptom perhaps, more suitable, and may be defined as a *tumor originating in a diseased condition of the blood-vessels of the lower end of the rectum, the vessels having undergone dilatation and proliferation*. It may be safely said that the majority of per-

*Read before the Medical Society of Amsterdam, N. Y., April 9, 1895.

sons who have reached middle life have suffered in some degree from some manifestation of piles; in fact, there is scarcely a disease of more common occurrence. And when we come to inquire into the ætiology of this disease we find that the causes of piles which have from time to time been given are indeed numerous, and that piles are met with under almost all conditions of life (in the male and female, among the opulent and poor, the sedentary and active), so that we must look for one common cause as the essential element in the production of the same disease under such diverse circumstances. I must agree with other writers. That the common predisposing cause is an anatomical one, and that the erect position occupied by man is the essential element, is I think a plausible theory. The rareness of cases occurring among quadrupeds surely tending to prove this assertion, and yet owing to the nature of their food, their uncleanness and irregularity of living, constipation and many other conditions, which are said to be the great causes of piles, do and must exist. Now, in order to understand and estimate the importance of this question, I will ask you to briefly review the more important anatomical facts in connection with the vascular supply of the lower bowel.

The arterial supply of the rectum is derived from three sources: the superior hæmorrhoidal branch from the inferior mesenteric, the middle either directly or indirectly from the internal iliac, and the inferior hæmorrhoidal from the pudic. Of these the most important is the superior, which differs from the others by being a single vessel and not symmetrical. The superior hæmorrhoidal artery passes down between the layers of the meso-rectum and then divides into two branches, each of which forms a loop at either side of the bowel, the convexity looking downwards. From these two loops a variable number of vessels pass directly downwards, perforating the muscular coat, and then, lying immediately below the mucous membrane, they descend, one in each of the columnæ recti to the anal verge, inosculating freely with one another, and at the lower end of the rectum communicating by

transverse branches of some considerable size. Thus it will be seen that the entire mucous membrane, down to the very termination, is supplied by branches of the superior hæmorrhoidal artery, the middle and inferior hæmorrhoidal vessels being distributed to the tissues on the outside of the lower end of the bowel and the skin immediately surrounding the anus. The distribution of the veins is somewhat similar; the blood from the lowest portion of the mucous membrane of the rectum is first collected in a number (generally about twelve) of little dilated pouches, arranged in a circular manner, situated immediately within the anal verge; from these, small venous radicles ascend, inosculating to form larger branches, and, at a distance of about three inches from the anal margin, the veins, generally about five or six in number, perforate the muscular coats of the rectum by passing through oval slits in the muscular structure.

Verneuil has laid great stress on this arrangement in the ætiology of piles, for as these apertures are unprotected by any fibrous canal, the veins must be subjected to considerable pressure, and retardation of the flow of blood through them during the contraction of the muscle must result. The veins having thus emerged from the rectum become tributary to the inferior mesenteric vein, and finally discharge their blood into the vena portæ. Like all the veins going to form the vena portæ, these vessels are destitute of valves, consequently the walls of the hæmorrhoidal vein have to withstand the pressure of a considerable column of blood, the tension of which is at all times liable to be increased by hepatic obstruction and intra-abdominal pressure. Veins also accompany the branches of the inferior and middle hæmorrhoidal arteries, but, unlike the vessels just described, they discharge their blood into the general or caval circulation, and consequently are unaffected by changes in the portal system. A very free anastomosis does not take place between these two systems of vessels. This is what we might expect from a consideration of the development of the lower bowel. The rectal pouch is at first a cul-de-sac, situated at some distance

from the perinæum, and as it descends it carries with it its own proper blood supply, which is similar in its source and arrangement to that of the rest of the intestinal tube; the anal depression, with its cutaneous appendages, which finally unites with the rectum, being supplied with vessels analogous to those of other cutaneous surfaces. I may, while dealing with this point, mention in passing, that this want of communication between these two systems demonstrates the futility of applying leeches around the anus with a view of relieving portal congestion, a method of treatment which, nevertheless, is still frequently had recourse to by physicians. It is obvious that, applied to the skin in the vicinity of the anus, they can be of no more use than if they were applied to any other part of the surface of the body. Another anatomical point which must not be lost sight of, is the extreme mobility and dilatability of the structures constituting the termination of the bowel as favoring the free growth of tumors. To sum up, then; small dilatations occur normally at the commencement of the rectal veins; the blood returning through them has to pass up against gravity while the body is in the erect or sitting posture, and, as the vessels are unprovided with valves, the whole weight of the column of blood presses continuously upon their radicles, the veins are subjected to pressure while passing through the muscular wall; and, again, at the liver obstruction is common. The act of defæcation has much to do with the ætiology of piles. During the passage of a solid mass of fæces along the great intestine considerable pressure is exercised on the blood-vessels. In the colon and in the first part of the rectum this is rather salutary than otherwise, as the vessels are arranged for the most part at right angles to axis of the bowel, so that the contraction of the tube empties the veins into the larger channels; but when the lower portion of the rectum is reached this is not the case. As previously mentioned the vessels of the lower bowel are arranged parallel to the direction of the intestine, consequently the passage of the fæcal bolus forces the blood in the opposite direction to that in which it should flow in the veins.

An illustration will make this more clear. If an elastic band is passed around the arm and gradually rolled down towards the hand, the superficial veins below the point of constriction are rendered full and prominent. Now, a strictly analogous thing occurs during defæcation, with the exception that the veins are to be found in the outer and compressing tunic, and it is the solid mass of fæces in the interior that moves on. The passage, therefore, of every hard and constipated motion, which, as we know, subjects the veins of the hæmorrhoidal plexus to a very considerable dilating strain, and consequently furnishes one of the most important, if not the principal, factors in the ætiology of piles. When the abdominal muscles are called into forcible action, a considerable amount of pressure is brought to bear on the entire system of veins, and under ordinary circumstances the sphincters and the levatores ani, acting simultaneously, equalize the external pressure on the hæmorrhoidal plexus, so that no dilating strain can be experienced; but when defæcation is taking place, the latter muscles are relaxed, while the abdominal muscles are contracting forcibly; consequently there must be a strong tendency to regurgitation of blood into the rectal veins. All prolonged efforts of straining at stool are, therefore, to be avoided by persons with any tendency to hæmorrhoids; at the same time the bowels should not be allowed to become too constipated, and food calculated to leave a hard fæcal residue is to be avoided.

Much has been written on the relative frequency of piles in the male and female sex, and very opposite opinions are to be found in the works of different authors on the subject, I find the ratio is about five males to three females. But females, from natural delicacy, are apt to postpone consulting their medical attendant for treatment of piles, even if they be bleeding; they are so accustomed to observing the menstrual flow that they attribute but slight importance to a bloody discharge from a neighboring organ. It very frequently happens that we find anæmic women suffering from bleeding piles, who have either not noticed or paid little

attention to the bloody discharge from the rectum until their attention has been directed to it by their physician. In men, on the contrary, a discharge of blood at once attracts their attention, and they forthwith consult their doctor. There are several reasons why we should expect piles to be more frequent in women than in men. In the first place the pressure of a gravid uterus tends to produce dilatation of the veins of the hæmorrhoidal plexus in the same way that it produces varicosities of the labial veins and those of the lower extremities, both during pregnancy and immediately after parturition. Another cause, which must not be lost sight of, is the habit which women undoubtedly have more than men, of allowing their bowels to become habitually constipated, although this may be to a certain extent counter-balanced by the greater pelvic capacity which they possess. In women, also, at the menopause, a discharge of blood from the rectum, frequently attended with the presence of hæmorrhoidal tumor, is of extremely common occurrence, and the pressure of a retroflected uterus, or of tumors connected with the ovaries or other pelvic viscera, may sometimes be admitted as a cause of this disease. On the other hand, men are, as a rule, more exposed to the deleterious influences of excess in eating and drinking.

Piles are essentially a disease of the middle period of life, their occurrence under the age of puberty being extremely uncommon.

On the other hand, piles but seldom originate in old people, except as a result of paralysis of the sphincter muscle, either associated with general paralysis or from intrinsic relaxation.

It is almost impossible to form an opinion as to the influence of heredity in a disease so wide-spread and common as piles. No doubt the habits of life which help to the formation of hæmorrhoids are frequently inherited, and to this extent heredity may be admitted as a cause. Excessive eating must be admitted as an important element in the formation of this disease, as physiology teaches us that a general engorgement of the portal system of veins takes place during

digestion. This engorgement, when frequently repeated and carried to an abnormal extent, will produce a permanent dilatation of the tributaries of the vena portæ, and so the formation of hæmorrhoids may be originated. The habitual use of strong purgative medicines, which cause a catarrhal condition of the mucous membrane by the congestion which is produced, tends to the formation of hæmorrhoids.

If the habit of getting the bowels to move once a day at a certain hour is cultivated, it can generally be acquired without the use of cathartics. Immediately before going to bed is the best time, as the rest in the recumbent position tends to relieve the congested mucous membrane.

Inflamed pockets and papilla and pruritus (which is generally caused by uncleanness), must also be a factor in producing a more or less constant irritation, and to a greater or less extent a congestion of the hæmorrhoidal veins. Pruritus is many times caused by using hard paper, and in fact the softest paper may be a factor, inasmuch as, in rubbing the skin about the anus, the sweat glands become plugged with fæcal matter, and it simply acts as a foreign substance, causing irritation and inflammation. It is by leaving the skin about the anus covered with fæces, which contain large numbers of the bacilli coli communis, and in this way (as recently stated by Surgeon-General Sternberg of the army) they easily get into the urinary tract, and often, as he said, cause surgical kidney and cystitis when some orificial obstruction to the free flow of urine is present. Therefore I believe that the anus should be washed after each stool as carefully as we would wash our hands, and paper, no matter how soft, never used.

For consideration of the treatment of piles, we will divide them into internal, middle and external, and the external may be again divided into venous and cutaneous.

Like all other diseases depending for their diagnosis upon skill and accuracy in physical examination, rectal troubles are the source of endless blunders and failures on the part of those who are content with half measures, or who let mere

inference take the place of that persistent study which is due each individual case. And so, I would say, be thorough in your examinations, and sure of the condition you are treating before you treat it, otherwise failure will surely be the outcome of your efforts.

To my mind the only treatment for the permanent relief of piles, wherever found, is the radical one of removal; temporizing or palliative treatment may give relief for a time, but they will recur, and each attack will be more severe than the previous one, until the sufferer is compelled by his physical condition (which is one usually bordering on nervous prostration) to seek relief.

Internal piles—that is, those above the internal sphincter—should, I believe, be removed by the clamp and cautery, and never cut, unless in the Whitehead or American operations for the removal of all the pile-bearing surface. In this connection, let me say, it is never wise to try to remove a pile tumor without first having dilated the sphincters, in order that you may have plenty of room to work and the more easily to control hemorrhage, if any occurs. Then, after having dilated and thoroughly cleansed the sigmoid flexure, apply your clamp, cut off the protruding mass and use the cautery. But, unfortunately for the patient, internal piles seldom occur without the middle or external or a very redundant mucous membrane. If this is so, the two operations I consider best, and which have been most effective in cases upon which I have used them, are the American and the Whitehead operations. The latter, as you know, is the one in which the dissection takes place from the skin about the anus to above the hæmorrhoidal membrane, dissecting away the tumors, and finally attaching the healthy mucous membrane to the healthy skin below. For the reason that less hemorrhage and less time is occupied in performing the American operation (brought out by Dr. Pratt, of Chicago), I very much prefer it to the Whitehead. In this the dissection begins above the line of the diseased tissue, and all that portion below is removed, the healthy mucous membrane

brought down and attached to the skin in a like manner to the Whitehead operation, although greater skill may be required in dissecting the mucous membrane from the sphincters before attaching it to the skin below. If this be not carefully done you will not get the brilliant result one otherwise would. For the removal of piles which are between the sphincters or the external venous tumor, the slit operation is in my opinion the best. It consists simply in removing a narrow strip of membrane from the top of the tumor, and either rolling out the clot in the acute external one or cutting out the internal redundant areolar and mucous tissue which may have softened and more or less disintegrated. This slit operation should never be done without the aid of an anesthetic and complete dilatation of the sphincters. Sewing up the slit after removing the pile tissue has been strongly advocated by French surgeons, and does give good results where there is not too much tissue removed.

The acute external variety, which are hard, hot and painful and always contain a blood clot, may be quickly slit open (cocaine as an anesthetic) and the clot rolled out. The cutaneous or skin pile, which is nothing more or less than hypertrophied skin, the result of the former, should be removed by excision, as they form a source of irritation which may result in a pruitus-ani or more serious complication within the rectum. In passing I only want to call your attention to two methods of treatment of piles which have been used to some extent, and which I consider almost barbarous and of doubtful value. They are those of ligature and the method of injection. Slow, painful and tedious is this treatment, and patients who have submitted to either would rather suffer all their lives with piles than submit to a repetition.

In these days, when we have so many devices for controlling hemorrhage, we have comparatively little to fear from that source, and therefore we should never hesitate to cut. Piles occurring among hæmophilia are very rare, and consequently we have little to fear from this source.

Palliative treatment should consist, first, of rest in the recumbent position, the relief of constipation, if any exists

(by using pill or tablet of aloin, belladonna and strychnia, some preparation of cascara sagrada, confection of senna, or glycerine suppositories), and the application of continuous cold, by means of the irrigating tube, or cold compresses, and the use of suppositories containing opiates, cocaine, hyoscyamus and belladonna; or tannin, sulphate of zinc, alum and like astringents. But do not forget that astringents of the tannin group are incompatible with morphine, cocaine, vegetable alkaloids and salts generally. A suppository of which I am very fond is one containing:

Solid extract of ergot, gr. 11.
Extract of opium,
Extract of nux vomica,
Cocaine hydrochlorate, each gr. $\frac{1}{4}$.
Ol. theobroma to make suppository.

Or one consisting of:

Chrysarobine, gr. 1.
Iodoform, gr $\frac{1}{4}$.
Belladonna extract, gr. 1-10. to make a suppository.
One every four hours, or night and morning.

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ANNOTATIONS.

The Accidents of Serum Therapy.—Dr. Perregaux (*These de Paris*) has collected and reported the accidents which are chargeable to antitoxin in the 249 cases in which it was used at the Hospital Trousseau. Of the local accidents, abscess was observed but once, but there were generally noted painful sensations at the site of the injection, lasting for 24 hours; these are avoided by strict asepsis of the field and of instruments. Of cutaneous manifestations during the treatment in hospital, there were observed 33 cases: urticaria, 14; polymorphous erythema, 9; scarlatiniform erythema, 9; and purpura, 1. After the return to their homes, 57 cases: urticaria, 19; polymorphous erythema, 5; scarlatiniform erythema, 3; purpura, 1. Of the articular manifestations there were observed at the hospital, 11 cases; after the return to their homes, 19 cases. Diphtheritic paralysis was noted at the hospital twice, of which one was fatal. After leaving the hospital 21 cases were found, four of the lower limbs and the remainder of the soft palate. Persistent albuminuria was found in six cases. Great reserve must be observed when an opinion is to be given concerning the cases of nephritis which have been suspected. The statistics of albuminuria are hardly changed by the serum therapy. Cardiac accidents are rare; only five times were their symptoms noted before death. Of the rare accidents, anuria, fetid and persistent diarrhœa, meningeal symptoms, all occurred in one case.—*Journal des Practiciens*, 1895, No. 8, p. 120.

Lycetol.—In the treatment of chronic gout and rheumatism, the alkalies, especially the compounds of lithium, have long been esteemed among our most valued remedies. It is for this reason that after the pronounced properties of Piperazine as a uric acid solvent and anti-arthritic had been established, efforts were made to combine this substance with one of the vegetable acids, which as is well known, became changed into carbonates in the blood and increased its alkalinity of this fluid, as well as of the other secretions. The outcome of these experiments is Lycetol which is the tartrate of dimethyl-piperazine, combining the alkaline and uric solvent powers of piperazine and tartaric acid. With regard to the therapeutics of this new remedy, the editor of the *Chicago Medical Recorder*, May, 1895, writes as follows: "Lycetol acts as a diuretic and also decreases the specific gravity of the urine, by preventing the formation of an excess of urea. It does not interfere with the function of any organ. It retards the formation of uric acid, and is of much benefit in rheumatism. With all the beneficial results to be obtained from piperazine, it is thought this agent will excel it."

A New Method of Making Palatable and Digestible Milk.—Dr. Robert T. Edes, of Boston, gives a valuable way of preparing milk where other methods have not proved useful:

A pint of milk is gently warmed, into it is dropped, very slowly and with constant stirring, about 20 minims of the dilute hydrochloric acid of the United States Pharmacopœia. The milk should be stirred until it cools. In this way a very fine flocculent coagulum is produced, floating in the whey, which is easily accessible to the digestive secretions, while the whole fluid has lost some of the flat and cloying taste which makes it unacceptable to so many. It will be noticed that milk prepared in this way differs from the various "wheys" in the highly important particular that the casein is retained and used, instead of being separated out as a distinct product, while it avoids the bitterness of pancreatinized milk.—*Boston Medical and Surgical Journal*.

The Treatment of Headache.—In the *Lyons Medical* for May 5th there is an abstract of an article by Dr. Mobius, which was published in the *Union Pharmaceutivue*. The author finds that it is possible to stop the tendency to fresh attacks of headache by the use of sodium salicylate. Every evening, and also in the intervals between the attacks, 15 grains of this drug should be

given in a cup of black coffee. Its employment is to be more or less prolonged according to circumstances. The author does not hesitate to use morphine subcutaneously in cases where the pain is too violent to yield to the employment of antipyrine, sodium salicylate, etc.

A Quick Method for the Filtration of a Small Quantity of Urine.—For a very long time it has been a problem to know how, with the apparatus usually at hand, to obtain quickly and easily a small quantity of clear urine from a cloudy specimen in order to make the usual test for albumen.

The following plan, which has proved extremely easy and satisfactory in my own case, will, I think, be found equally so in the hands of others: A small quantity of the cloudy urine is placed in a test-tube, and the mouth of the tube plugged with cotton to a moderate degree of firmness. A second test-tube is placed with its mouth to the first. The position of the tubes is now reversed so that the one with the urine is bottom upward. The upper tube is now carefully and gently heated over the flame of a Bunsen burner or an alcohol flame, and the expansion of the air above the urine immediately forces it through the cotton plug, and the filtered urine collects in the lower tube. In this way we imitate to a degree the rapid-filtering apparatus of laboratories, but use pressure above the fluid to be filtered instead of an air-exhaust below.—L. F. Bishop in *Boston Medical and Surgical Journal*.

The Preventive Treatment of Seasickness.—Chlorobrom, which is a solution of chloralamide and potassium bromide, is the latest remedy proposed for the motion-sickness so terrible to many ocean travelers and railway tourists. From the results of its use in 300 cases reported by ship's surgeons in medical charge of steamers plying between Great Britain and the United States, Canada, India, Australia and New Zeland, Dr. M. Charteris, professor of materia medica and therapeutics in the University of Glasgow, reiterates in the *Lancet* of April 21st, that chlorobrom, judiciously taken, will prevent an attack of seasickness, or cut it short if it has already begun. He states, however, that no prophylactic benefit can be secured by the use of chlorobrom in long sea voyages unless for two nights before embarkation, the passenger depletes the stomach and bowels by taking a cholagogue pill. Persons who dread the voyage will be helped by a previous dose of the solution. On board the vessel, the diet should be

spare and dry. No full meal should be indulged in, and soup, pastry and sweets especially, should be avoided, and a hypnotic dose of chlorobrom should be taken for three nights, a tablespoonful at a dose for women and a tablespoonful and a half for men. For short voyages, beginning about 10 P. M., the passenger should take one dose of the size mentioned and immediately go to bed. Immunity from seasickness is obtained in the great majority of persons if these directions are followed, but if they are not, the result will be that the chlorobrom will have no effect in arresting an attack of vomiting. Teaspoonful doses given every 10 minutes until a tablespoonful or a tablespoonful and a half has been given, will, however, almost invariably check the retching and depression, which Dr. Charteris believes are due to irritation of the vomiting center in the medulla oblongata consequent upon the vomiting caused by the gastric disturbance due to the unusual amount and uniformity of motion.—*New York Medical Journal*.

Transmission of Cholera by the House Fly.—Craig (*Medical Record*) has made some careful experiments by feeding common house flies with a fresh boillon culture of the cholera spirillum. At the end of three days they seemed uninjured, and when the intestinal contents were removed, with every precaution to prevent contamination from the exterior of their bodies, the nature of which was confirmed by culture experiments and the obtaining of the red culture reaction by the addition of acids to beef-tea culture. If the common house fly is able, without injury to itself, to carry and transmit the cause of cholera, its agency in the extension of epidemics is probably important and may be difficult to combat.—*Philadelphia Polyclinic*.

Indicanuria.—Dr. Gehlig gives the following conclusions, based upon a considerable number of observations upon children both sick and well:

1. Nurslings in good health or children fed upon sterilized milk, and not the subjects of digestive troubles, sometimes present a trace of indican in the urine.

2. If digestive disturbances occur almost always some indican is found, its quantity varying with the gravity of the affection. In chronic catarrh of the intestines, cholera, and typhoid fever, it is particularly marked.

3. In older children without digestive trouble, the urine normally contains indican. If the diet includes a high proportion of nitrogenous food (eggs, meat), indican becomes more abundant.

Cima has published the results of examinations in 68 cases. Most of these children were fed simply on bread and milk, some on bouillon, vegetables, and eggs, and others on mother's or cow's milk.

1. Cases of clinically declared tuberculosis of abdominal or thoracic organs—10 cases. Almost all had some irregularity of digestion, and the stools were mostly liquid or semi-fluid. In 99 analyses, 69, or 69.69 per cent, gave positive reactions, while medium or very marked reactions were given in nearly half, or 45.5 per cent. In these same cases very marked reactions were obtained after some days of feeding upon a diet richer in albuminoids, or during constipation. On the other hand, the reaction was slight or feeble when the children were put upon milk or had fluid or semi-fluid stools.

2. Cases suspected of tuberculosis, with adenopathy, chronic catarrh of intestines, or intermittent catarrh of bronchi—23 cases. In 73 analyses, 75.34 per cent gave positive reactions, or 46.57 per cent of medium or marked reactions.

3. Cases of divers acute and chronic diseases—35 cases. In 88 examinations, 38 were without reaction, while 30 per cent of medium or marked reaction were given for the most part by children over two years of age nourished on a mixed diet.

The conclusion from these results is that the indican reaction in the urine is more positively connected with anomalies of digestion, especially in mixed feeding, than with the principle malady. Consequently indican has no other diagnostic importance than that of indicating the degree of decomposition of albuminoid substances in the intestines.—*American Journal of the Medical Sciences*.

Trional, A Pure Hypnotic.—Although the Pharmacopœia has furnished the physician with a multitude of drugs designed to produce sleep, few of these can lay claim to the title of pure hypnotics. Opium and its preparations, which are more frequently prescribed for the relief of insomnia than other remedies are attended with so many unpleasant after-effects, that their use should be restricted to cases in which sleep is prevented by the

presence of bodily pains—they are renarcotics rather than pure hypnotics. Up to a comparatively recent period chloral and the bromides constituted our sole remedies of this kind, but at the present time the ceaseless activity of the pharmaceutical chemist has provided the practitioner with a considerable number of hypnotics, good, bad and indifferent. Amongst these Trional has been found to embody the properties which go to make up an ideal pure hypnotic, more perfectly than any other drug yet discovered. Dr. Dezso Haftl (*Pest. Medic. Chirurg. Presse*, No. 43, 1894) who has recently investigated the hypnotic action of Trional, never observed unpleasant or injurious effects from its use, even when administered for a number of weeks. Although a prompt and reliable sleep-producer, it was completely devoid of any action upon the organic bodily functions. The temperature was not affected even by very large doses. The circulation remained undisturbed, except that the pulse became slightly slower during the sleep, which is in accordance with physiological conditions. The advantages of Trional over other hypnotics are, according to this author, its ease of administration, the rapidity of its effects, and especially its freedom from injurious action upon the heart, the vascular system and the vital functions. He found it especially serviceable in agrypnia following functional psychoses in motor restlessness with hallucinations, but above all, in cases where it was necessary to replace chloral and morphine by a reliable and innocuous remedy.

In an excellent article in the *New York Medical Journal*, March 2d, 1895, on "Insomnia and Surgery," Dr. G. G. Van Schaick also assigns an important place to Trional in the treatment of this condition, and concludes as follows: 1. That insomnia, from whatever cause, is an important complication of surgical disorders. 2. Its relief is necessary to the comfort of the patients, improves the prognosis and materially assists recovery after operation. 3. Where pain is the chief factor, morphine is the only drug that will relieve with certainty. 4. There are many surgical disorders in which insomnia may be relieved by Trional; and finally, 5. Trional is an excellent drug for the purpose, as it acts rapidly and safely, has no inhibitory action upon the secretions, and fails to produce unpleasant after-effects.

The Celestial Method of Detecting Opium.—In the forty-second issue of the "Chinese Imperial Maritime Customs Medical

Reports," published at Shanghai, Dr. George S. Underwood gives an interesting account of the medico-legal method employed by the Chinese mandarin for the detection of opium in the corpse of a person alleged to have died of the poison. We commend it to our chemists for its novelty and the ease of its carrying out; leaving its accuracy to the test of time, experience and medico-legal wisdom.

There had been sorrow and confusion in the family of Huang-Hu. The mother, a woman (for even in China the mothers are women), was dead. The questions were, why did she die? how did she die? and, perchance, by whom did she die? So the court of the mandarins was assembled. Under the stern direction of the mandarin judge, the mouth, nostrils, vagina and rectum of the unprotesting corpse were tightly plugged with wet paper, and two probes of untarnished silver, about twelve inches long, were passed for nearly their full length—one into the rectum, the other into the mouth. Next, the head and trunk were wrapped in sheets of wet paper, the whole body enveloped in quilts, and boiling water, kettleful after kettleful, was poured as quickly as could be procured over the corpse. The temperature was 95° F. in the shade; the afternoon was broiling hot; dinner had been postponed; no wonder the temper of the Chinese mandarin was only prevented from boiling over by a series of acrid remarks to the corpse, the attendants, and the world in general. The pouring and the objurgations went on *pari passu* for an hour and a half, when the face was uncovered, and the probe passed in through the mouth found to be untarnished. After sundry headshakings and expostulations the probe was replaced; again the stream of heated water and heated words splashed on the bystanders until another fifteen or twenty minutes had passed, when the mouth probe was again brought to light; and in its blackened surface celestial wisdom read the story of opium poisoning; a story which received further confirmation when from the uncovered swollen body the rectal probe was taken out and found badly stained.

After it was shown that the woman truly was dead of opium, the hunt grew hot for the author and source of the poisoning. The sleuth-hounds of the Law Department of the University may well be interested in the unwindings and outgoings of the court hereafter; but for the medical man the interest of the case ceases with

the determination of the death; and so, as with the lady and the tiger, we leave unsolved the why, the wherefore, and by whom the death came.—*University Medical Magazine*.

Diagnostic Importance of Enlargement of the Cutaneous Veins at the Lowermost Part of the Thorax,—Dr. W. Hirshloff calls attention to the high diagnostic value of these venous dilations. Affections of the lungs, heart, serous membranes surrounding these organs, mediastinal diseases and those of the great vessels will give rise to such signs. They are in general due to two causes—hindrance to the venous return to the heart and development of collateral circulation. As the veins of the anterior thorax empty into the superior vena cava through the internal mammary, the intercostal veins and the brachio cephalic trunks, a compression of these vessels would cause a consequent enlargement of the cutaneous veins. Compression is generally caused by primary or metastatic new growths of the mediastinal space, lymphomata, lymphosarcomata, substernal strumous growths, or pulmonary neoplasms, aortic aneurisms or enlarged glands. Often the dilated veins are the first signs of intrathoracic disease. Another very frequent cause of extensive venous nets forming on the thorax is a preceding contraction of the pleura or pericardium after preceding inflammation of these membranes, frequently occurring years before. This may cause nearly complete obliteration of the greater vessels and even death. Venous dilatations developing in the course of a few hours are dependant upon thrombosis of either jugular, subclavicular or anonymous veins. As this more frequently is observed on this side. Dilatations from mere mechanical pressure sometimes give rise to very extensive enlargement, even of the size of one's finger, as in a case observed by the writer, where from capillary dilatation the arterial pulse was transmitted into these veins so as to cause them to resemble arteries. Yet on deep expiration, this pulsation would cease and the vessels be overfilled. In some cases thrombosis of these veins has been noticed. There is still another form of dilated veins, at the lower portions of the thorax especially. The vessels are prettily arranged in a branched and dendritic manner along the border of the lowest rib. They are dependant upon defective muscular action in this portion of the chest in respiration; they are liable to be quite pronounced in four-fifths of emphysematic patients.—*Deutsch Medizinische Wochenschrift, New York Medical Times*.

Naupathia or Sea Sickness.—Skinner formulates the following conclusions: 1. The principal symptoms of Naupathia result from the lowering of the patient's arterial blood pressure. This is a condition *sine qua non* of their development. 2. Sea Sickness in a person otherwise healthy and not too aged, is promptly curable in a vast majority of cases. 3. Even an aged person, or in persons having certain affections of the circulatory apparatus, there is often amelioration of the general condition by the employment of the new method of treatment. 4. The treatment consists in the hypodermic injection of from half a milligramme of atrophine sulphate, associated with a milligramme of strychnine sulphate (or nitrate), dissolved in a cubic centimeter of distilled mint water. 5. The administration of these eminently toxic substances demands a great degree of attention, prudence and supervision on the part of the physician, who alone should be the judge of the opportunity of their administration and of their dose in each individual case. Given at proper times and in suitable doses, however, no harm however will follow their administration. 6. The sympathetic nervous system plays a prepondering role in the causation of naupathia. 7. Naupathia, or sea sickness—an affection without known anatomical lesions, and of which the predominant symptoms have their origin in the nervous system, and especially in the sympathetic or ganglionic nervous system, ought to be regarded as a neurosis of the sympathetic. 8. The neurosis may recur during the course of a long voyage, but each attack is almost always amenable to the same treatment.—*New York Medical Journal*.

Peroxide of Hydrogen.—By J. P. Parker, Ph. G., M. D., of St. Louis, Mo. I have used peroxide of hydrogen quite extensively for cleansing discharging ears, the nasal and accessory cavities, and have tried all the brands of the preparation in the market, and once thought one manufacturer's make as good as that of another, and bought the cheapest as a matter of economy, but recent experience has taught me that the difference in quality is greater than the difference in price. After an unpleasant experience with a solution of peroxide of hydrogen which severely injured the mucous membrane, I bought and examined, chemically, a bottle of each preparation of H_2O_2 in the market, and was surprised to find so much difference. Some are useless, and others worse than useless, because they contain too little available oxygen and too much free acids (phosphoric, sulphuric, hydrochloric). I now order Marchand's (medicinal) exclusively, because I find it contains the desired quantity of

available oxygen and not enough free acid, to be objectionable, and its keeping properties are all that could be desired.

By inquiry I learn that Marchand's is the preparation that is used by almost all surgeons, and it is considered by them the standard.

My personal experience with peroxide of hydrogen confirms entirely the statement of Dr. J. P. Parker. I have used exclusively Marchand's brand until lately, when I experimented with hydrozone. Then I gave up entirely the use of peroxide of hydrogen and use hydrozone on account of its strength, which cannot be compared with any other brand, even Marchand's. I must say that the results which I obtained with hydrozone are most gratifying.—ED., *The Times and Register*.

REVIEWS AND BOOK NOTICES.

Materia Medica, Pharmacy, Pharmacology and Therapeutics.—By W. Hale White, M. D., F. R. C. P. Edited by Reynold W. Wilcox, M. A., M. D., LL D. Second American Edition. Thoroughly revised. Philadelphia: P. Blakiston, Son & Co., 1012 Walnut Street. 1895.

This edition has, as is the rule of most of the materia medicas which have appeared lately, been written to conform to the changes made in the United States Pharmacopœia of 1890.

Though originally produced for English students using the English Pharmacopœia, the definitions, and pharmaceutical processes have been corrected for the use of American physicians.

The first part of the work, after giving definitions, and some pharmacy, deals in a general way with pharmacology and therapeutics; and gives lists of drugs acting in various ways on the different parts, and tissues of the body.

The second part takes up the individual drugs, discussing first the inorganic salts, and then the organic drugs used in the materia medica.

Under each head is given the different preparations of the drug or the salts produced from it: next its pharmacological actions, both local and general; and then the therapeutics is discussed.

The entire work is comprised in a single book of about 600 pages and is especially valued in that it contains, not only the official drugs of the pharmacopœia, but also the more important of the unofficial which are clamoring for recognition, but whose merits have not yet been sufficiently tested, or are not yet proved to be worthy of a place in our official lists.

The book is ably written, and worthy of the confidence of American students and physicians.

An International System of Electro-Therapeutics: for Students, General Practitioners, and Specialists.—By HORATIO R. BIGELOW, M. D.; and thirty-eight associate editors. Thoroughly

illustrated. In one large royal octavo volume, 1160 pages, extra cloth, \$6.00 net; sheep, \$7.00 net; half russia, \$7.50 net. PHILADELPHIA: THE F. A. DAVIS CO., PUBLISHERS, 1914 AND 1916 CHERRY STREET.

The work of compiling the various subjects in this large volume has been intrusted to thirty-eight authorities, each of whom is a specialist on the topic on which he writes.

As a result we may have a number of well conceived and well expressed essays on all of the various phases of electrical phenomena and therapeutics that are at present of use in medical science.

To show the number of topics treated and the many uses to which electricity is now put by physicians, the following list of chapters in this work are given:

Introduction—The Necessity for Special Education in Electro-Therapeutics; Electro-Physics; Animal Electricity; Static-Electricity and Magnetism; Faradic or Induced Current, Electro-Magnetism, Electro-Massage, and Instruments; Galvanism; Electro-Physiology; Electro-Diagnosis; Cataphoresis, Anodal Diffusion, Electrical Osmosis, or Voltaic Narcotism; Intestinal Occlusion Treated by Electricity; Diseases of the Alimentary Tract, Diseases of the Liver and Kidneys, Gout and Rheumatism; Electro-Therapeutics of Diseases of the Lungs and Heart; Diseases of the Uterus; The Electrical Treatment of Fibroid Tumors of the Uterus; Discussion of the Electro-Therapeutic Methods of Apostoli and Others; The Treatment of Diseases of the Uterine Appendages by Electricity; Engorgement and Displacements of the Uterus; Disorders of Menstruation; Treatment of Diseases of the Female Urethra by Electricity; Ectopic Gestation; The Treatment of Cancer of the Uterus by Electricity; Facial Blemishes; Electricity in Diseases of the Skin; Diseases of the Nose, Naso-Pharynx and Larynx; Ophthalmology; Diseases of the Brain; Neuroses; Diseases of the Spinal Cord; On the use of Electricity in the Treatment of the Peripheral Nerves; Electro-Thermal Surgery; Treatment of Strictures by Electrolysis, Hypertrophy of the Prostate; Abscesses, Adenomas, Adipose Tumors, Aneurisms, Collosities, Hæmorrhoids, Torticollis, Specific and Malignant Diseases of the Rectum, and Ulcerations; Incontinence of Urine, Orchitis, Hydrocele, Spermatorrhœa, Gonorrhœa; The Use of Electricity in Obstetrics, Galactorrhœa, Sore Nipples; Electricity in Diseases of Childhood; Adhesions in the Acute and Chronic Inflammatory Disorders of the Female Pelvis.

As the above enumeration of subject matter indicates, the whole field of medical and surgical electricity is thoroughly covered in this complete book.

It will undoubtedly become the standard work on electro-therapeutics in the English Language.

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THE ADULTERATION OF DRUGS.*

BY WILLIS G. TUCKER, M. D., PH. D., ALBANY, N. Y.

(Continued from July Issue.)

Let us now consider, separately, some of the more important drugs found to be frequently of unsatisfactory quality, and in so doing it may be more convenient if we adopt a somewhat different classification, as follows: 1. Articles inferior or unsatisfactory from improper methods of manufacture, generally on a large scale; 2. From age or exposure; 3. From inferior strength or short weight; 4. From excessive strength; 5. From substitution of a different article of like nature, or article of the same nature, but of inferior grade; 6. From actual error in sale. This classification is far from perfect, but it will answer our purpose.

I. Articles of inferior quality, owing to improper methods of manufacture, generally on a large scale.

Among these, compound spirit of ether may first be named. It is my belief that many of our old-fashioned remedies are going out of use, not because better substitutes have been found, but because they are so generally of inferior quality as sold in the stores, that little dependence can be placed upon them. Of 603 samples of the preparation named which were examined, but 153, or little more than one-quarter, were found to be of satisfactory quality. "Hoffman's anodyne," as it is commonly called, is frequently prescribed by

* A lecture delivered before the Brooklyn Institute, May 24, 1895.

physicians and often employed as a household remedy, and while an article of good quality can be procured from responsible manufacturers, or prepared without difficulty by the intelligent and careful pharmacist, the fact is that a spurious article answering to none of the requirements of the pharmacopœia is generally sold in its stead, because it is cheaper. Hoffman's anodyne is quoted at fifty-five cents a pound in a recent price list published in a leading pharmaceutical journal, which is about one-third the price of the real article. This cheap, spurious and worthless article, obtained as a secondary product in the manufacture of ether, consists chiefly of alcohol, ether and water, with little or none of the ethereal oil upon which the virtue of the preparation largely depends. Dealers may urge that the sale of this spurious article as a household remedy to people who would complain of the price necessarily charged for a genuine article is excusable; but without admitting this as a valid excuse for dispensing a fraudulent and worthless drug, it is evident that its sale in response to a physician's prescription or written order, is entirely inexcusable and unwarranted and equally blameworthy, whether due to ignorance or cupidity. The habit of keeping two qualities of official drugs cannot be too strongly condemned, but the results of our examination would seem to show that many dealers, so far as this preparation is concerned, keep only one, and that a spurious article.

Spirit of nitrous ether, or "sweet spirit of nitre" is another of the old-fashioned drugs which is fast falling into disuse, and chiefly, as I believe, because so seldom found of good quality. This article is generally obtained by the retailer of the manufacturer, or what amounts to the same thing, prepared from the so-called "concentrated nitre" by dilution with alcohol. The process of manufacture has been repeatedly changed in the pharmacopœia. The United States Pharmacopœia process from 1820 to 1860 yielded a product containing, according to Dr. Squibb, about 4 per cent of ethyl nitrite, while the process of '70 gave a product of much lower strength. The process of '80 was claimed by the pharmacopœia to yield

a product containing at least 4 per cent, but Dr. Squibb has shown that it can yield but about 2.82 per cent of real ethyl nitrite. The process of '90 differs from that of '80, but is asserted to yield a product of the same strength. Due allowance was made for this over-statement as to strength in rating the samples examined up to January 1, 1894, when the new pharmacopœia took effect, and yet more than half of the samples examined were found to be of unsatisfactory quality and many of them contained scarcely more than a trace of ethyl nitrite. It is much to be deplored that such a condition of things should exist. It is not denied that the manufacture of this article is troublesome, nor that the preparation is one which must be well kept and carefully dispensed, since it unquestionably deteriorates by age and exposure. Nevertheless, an article which would be classed as good by the standard we have adopted, can be purchased in the market or prepared by the intelligent and careful pharmacist, and the sale of an inferior or decomposed article is entirely inexcusable and may generally be attributed either to the purchase of the cheapest obtainable goods or to gross carelessness either in the preparation or preservation of the article in question.

Chloroform is an article which has been both greatly improved and cheapened by the modern method of manufacture. The present pharmacopœia recognizes but one quality, and of late years most of the chloroform sold in the stores has been found to answer fairly well to the pharmacopœial requirements as to purity. Imperfectly purified chloroform is still sold, however, and should be carefully avoided for use as an anæsthetic. Of 123 samples examined, 26 were of unsatisfactory quality.

Precipitated sulphur is an agent of no great therapeutic value, perhaps, but it is used, both internally and externally, for a variety of purposes. It is a good example of a class of substances often sold in the stores of inferior quality because a cheap but impure article is easily obtainable. It should be made by boiling sulphur with slaked lime and decomposing

the resulting calcium sulphide and thio-sulphate with hydrochloric acid, precipitating the sulphur and yielding a soluble calcium chloride, easily removed by washing. A cheap and impure article known as "lac sulphur," a term not recognized in the pharmacopœia, is however manufactured in which the precipitation is effected with sulphuric acid, resulting in the formation of calcium sulphate, which, being but slightly soluble in water, and precipitated along with the sulphur, is not removed by washing, but remains as an impurity in the sulphur. It frequently contains as much as 40 per cent of calcium sulphate, and I have seen a sample which when used in a medicinal mixture contained so much that it solidified at the bottom of the bottle through the "setting" of the sulphate. Of 248 samples examined, but 77, or 31 per cent were of good quality. This sale of common *lac sulphur* for the official precipitated sulphur is entirely inexcusable, and since precipitated sulphur of good quality is easily obtainable in the market, at a slightly higher price, this substitution ought never to be made.

Potassium bi-tartrate, or "cream of tartar", is an article which has been greatly improved in quality of late years by the modern process employed in refining crude argol. The pharmacopœia of '80 allowed the presence of six per cent of calcium tartrate, but the revision of '90 requires a purity of ninety-nine per cent, and an article of this quality is easily to be obtained at the present time. The examination of a large number of samples purchased at drug stores showed them to be in almost all cases exceedingly pure but a very different article is generally sold by grocers for household use. One hundred and fifty-three samples, collected from retail grocery stores were examined, only fifty-five of which, or twenty-eight per cent, consisted of real and unadulterated cream of tartar. With the exception of ten samples, rated as fair, in which the amount of adulterants was comparatively small, the remaining eighty-five samples were either largely adulterated, entirely fictitious or consisted, in three cases, of articles wrongly sold. Of thirty-eight samples rated as

inferior, because containing some real cream of tartar, two were largely adulterated with starch; five with sulphate of lime; twelve with starch and sulphate of lime; one with tartaric acid and sulphate of lime; seventeen with starch and acid phosphate of lime, and one with starch, acid phosphate of lime and alum. Of forty-seven samples rated as fictitious, because containing no real cream of tartar, four were chiefly sulphate of lime and starch; twenty-six, acid phosphate of lime and starch; four, sulphate of lime and acid phosphate of lime; three, sulphate of lime and tartaric acid; six, sulphate of lime, tartaric acid and starch; two, acid phosphate of lime, tartaric acid and starch, and two, acid phosphate of lime, alum and starch. The sale of such miserable imitations for real cream of tartar is evidently without excuse and as the fraudulent substitute is frequently sold at the price of the genuine with perhaps less than a quarter and seldom more than half of its strength, it is evident that the purchaser is both deceived and defrauded. These substitutes are to be condemned also as being, in all probability, less wholesome than the article they replace.

Among other articles often of inferior quality from improper methods of manufacture may be mentioned the bromides of potassium, sodium and ammonium, and iodide of potassium, which frequently contain carbonates, sulphates, chlorides, bromates and iodates in quantities largely exceeding the pharmacopœial limits. Some of the bromides will be found to effervesce freely on the addition of an acid owing to the large excess of carbonates present. Such impurities are decidedly objectionable and it is not creditable to the makers that medicinal salts of so unsatisfactory a quality should be put upon the market.

II. *Articles of inferior quality owing to deterioration resulting from age or exposure.*

Ammonium carbonate belongs to this class of drugs. It may easily be obtained of good quality and can be kept in well-closed bottles without undergoing material change, but

by exposure to the air it rapidly decomposes and loses strength, becoming unfit for use. Though most familiarly known from its employment in smelling-bottles it is a therapeutic agent of no little value, being highly esteemed as a diffusible stimulant. Of twenty-eight samples examined in 1892, one only was of really good quality, and one was rated as fair. The remainder had a percentage strength of sixty-eight or under.

The same may be said of aqua ammoniæ. As a result of careless keeping or intentional dilution it is often of very inferior quality. The pharmacopœia recognizes two grades—the ammonia water and stronger ammonia water, containing ten per cent and twenty-eight per cent of ammonia gas respectively by weight. Of 179 samples examined in 1893 there were of good quality but 59; fair, 29; inferior, 60, while 31 were of excessive strength, doubtless prepared from the stronger water by incorrect dilution. The samples varied from 2.1 to 24 per cent and well illustrate how variable is the strength of articles of this class when sold at retail and in small quantities.

Magnesia is another article which is generally of very uncertain quality. Of 343 samples examined, but 154, or less than half, were of even fairly good quality. The others had become carbonated by exposure to air, and in some instances they consisted of magnesium carbonate, pulverized and ignorantly sold for magnesia. The pharmacopœial nomenclature is exact. Magnesia means magnesia and nothing else, and yet when called for in writing retailers will not infrequently inquire what kind of magnesia is wanted.

Lime water is another common article which is often of inferior quality and sometimes almost inert. For this there is no excuse. It is easily prepared and can easily be preserved if ordinary care be employed, but made as it is, and kept as it is in many stores, it is quite valueless. That it is not possessed of active medicinal properties furnishes no excuse for the sale of an inferior article. The care with which just such simple things as this are made and protected from

change, so that they may be dispensed in good condition, affords a pretty good indication of the general reliability of a dealer. Such errors may not be of deliberate intent. There is generally no desire on the part of the offender to deceive or defraud. They result from carelessness and inattention to details, like many other errors of greater importance, more frequently than from ignorance or evil intent. In England heavy fines have been imposed for such sales, and while this may seem to be severe treatment for a comparatively trivial offense, it is to be remembered that he who is inexact and careless in such matters is likely to be so in those of greater moment as well.

III. *Articles likely to be of inferior strength or short weight.*

Particular reference is here made to such articles as from inexact preparation, or intentional diminution in quantity of some important constituent, are likely to be of insufficient strength. Such is frequently the case with the diluted acids of the pharmacopœia. Of these, diluted hydrocyanic acid should have a strength of 2 per cent; acetic, 6 per cent; and hydrochloric, hydrobromic, sulphuric, nitric, hypophosphorous and phosphoric, of 10 per cent. But these preparations are often very carelessly made. Diluted acetic acid, for example, is one of the most unreliable preparations to be found in the stores. Of 456 samples examined, but 114, or just one-quarter, came within 5.5 and 7.5 per cent, and these were rated as good. The others varied from 0.3 to 35.6 per cent and these samples had evidently been prepared without any regard to accuracy, and in some cases the practically undiluted acid was sold. While it is not expected that such preparations will be made with scientific precision, gross carelessness in their preparation is entirely inexcusable. Diluted acetic acid is employed in the preparation of "spirit of mindererus," and if it is below or above the proper strength, this solution will necessarily be of uncertain quality.

Diluted hydrocyanic acid should contain 2 per cent of absolute hydrocyanic acid, but it is exceedingly liable to

decomposition, becoming brownish in color and unfit for use. No practical method of preventing this decomposition has yet been discovered. The only safeguard lies in dispensing an article which has been recently prepared. Forty-five samples were examined, of which none contained more than 1.47 per cent of absolute acid. One sample contained but 0.06 per cent. Nine samples were rated as fair, and the remaining 36 as of inferior quality.

Of diluted hydrobromic acid, 173 samples were examined, of which 117, or 68 per cent, were of good quality, the others varying from 3.2 to 21.2 per cent. Of diluted hydrochloric acid, 485 samples were examined, and 300, or 62 per cent, found to be of good quality. The extremes were from 1 to 13.1 per cent. Of diluted sulphuric acid, 443 samples gave 284, or 64 per cent, of good quality, with extremes from 1.3 to 38.8 per cent. Of diluted nitric acid, 17 samples out of 22, or 77 per cent, were of good quality, with extreme variations from 7.3 to 14.5 per cent. Of diluted phosphoric acid, 126 samples out of 162, or 78 per cent, were of good quality, and two samples of diluted hypophosphorous acid examined were both of inferior quality. Of the 10 per cent diluted acids of the pharmacopœia examined, therefore, but 66 per cent could be rated as of good quality, containing between 9 and 12.5 per cent by weight of absolute acid, and as 1,287 samples in all were examined, it is to be supposed that this pretty fairly represents the quality of the diluted acids upon the market. These acids, with the exception of hydrocyanic and hypophosphorous, are generally prepared by the retailer by dilution of the stronger acids, an operation not at all difficult to perform with reasonable accuracy, and it is somewhat surprising and disappointing that so great a diversity should be found in their quality as dispensed in the stores.

Compound solution of iodine, or "Lugol's solution," is a preparation which is often through carelessness or intent, of incorrect strength. Of 195 samples examined, 122, or 63 per cent, were of good quality, and the samples varied in per-

centage of iodine from 0.3 to 9.1 per cent. It should contain five per cent, held in solution by the potassium iodide which forms part of the solution. It is proper to note that it is not very extensively employed at present.

Tincture of iodine is also apt to be of uncertain strength. By the formula of the pharmacopœia of '80 it contained eight per cent of iodine, and that of '90 is approximately of the same strength. Of 663 samples examined, but 153, or 23 per cent, contained between seven and ten per cent and were classed as good, the other samples varying from 0.3 to 13.2 per cent. Certainly this is not a good showing for a preparation of much importance, and one easy to make and not difficult to preserve.

Aromatic sulphuric acid is another article which is of very uncertain strength as sold in the stores. Of 548 samples examined, only 68, or 13 per cent, could be rated as of satisfactory quality. This preparation should contain "about 20 per cent of official sulphuric acid by weight, partly in form of ethyl-sulphuric acid." The extreme variations in the samples examined were from 1.3 to 28.50 per cent. Such a result is at first sight most surprising, but it is to be observed in the first place that this preparation, though standard and in a sense, important, is, as a matter of fact, much less prescribed than formerly, so that it is prepared on a smaller scale and less frequently than heretofore. And, secondly, that many druggists continue to make it according to the process of the pharmacopœia of '70, which contained not much to exceed 10 per cent of acid. Such a practice is without valid excuse, though often defended. It results, in some cases, from a conservative clinging to an old and familiar process, and in others, from the fact that the only authoritative text-book in some stores is an old pharmacopœia, or more frequently, an old dispensatory based upon an old pharmacopœia. The intelligent, progressive and scientific pharmacist will adapt all his work to existing authorities and would as soon think of using last year's almanac as an old pharmacopœia. Cases may exist in which, of deliberate choice and intent, he may

retain an old process in preference to adopting the new one, and such a course may, in some instances, be defensible, but such cases will be rare exceptions and the educated pharmacist will regard the United States Pharmacopœia as his standard authority and feel that he is morally, no less than legally, bound to comply with its requirements.

In reduced iron we have another official article which seldom meets the pharmacopœial requirement as to proportion of metallic iron, which should be 80 per cent. Eight samples examined a few years since all fell below the standard, and of a very much larger number examined during the present year, very few conform to the official standard. A well-known firm of manufacturers quote in their list three grades; one, said to contain 80 per cent and entitled "U. S. P"; another, 65 per cent, and a third, designated as "black," 50 per cent. The real article should have a grayish-black color, but pharmacists assure me that many physicians prefer it black, and that such a preparation has to be supplied. If such articles are to be sold physicians should clearly understand their nature. Such sales are, however, in my opinion, entirely unjustifiable. Pharmacists cannot, with propriety, urge that such "black irons" are sold, not as U. S. P., but as "Quevenne's iron," or by some other trade name, for since the pharmacopœia defines the quality and sets a standard, the article should conform to this standard. In rating these samples, I have not been unmindful of the fact that it is difficult to manufacture and preserve reduced iron conforming to the pharmacopœial requirements, and we have classed as good, those samples yielding 70 per cent or upwards of metallic iron, and as fair, those yielding 60 to 70 per cent, so that only those falling below 60 per cent have been reported as inferior. Reduced iron is chiefly manufactured in Germany, and generally is made, as I am informed, by igniting the oxalate and not by reducing the oxide in hydrogen. This process leaves a certain amount of finely divided carbon in the product, imparting to it a black color. Whether in addition to this, carbon in any form is intention-

ally added to the preparation, I am unable to state. In this case pharmacists are not so much to blame as are the manufacturers, and yet they are legally responsible for the quality of the article they dispense.

Seidlitz powders are frequently of inferior quality in that the proportion of rochelle salt is often diminished, that of the cheaper sodium bi-carbonate being increased, and they are often so carelessly made, the constituents being generally measured out and not weighed, that a very uncertain chemical result is obtained on dissolving and mixing the contents of the papers. Some years ago I made careful analyses of 70 powders purchased in different stores, and found that while the weights of both the acid and the seidlitz mixture showed a great diversity, being in some instances less than half and in others twice the correct weights, the average weights were not far from correct, but the ratio of rochelle salt to soda in the mixture, was, in at least a third of the samples, too low to be explained, save by intentional decrease. The official proportions are almost precisely those required by theory to secure perfect neutralization of the tartaric acid by the sodium bi-carbonate and it will readily be seen that if these proportions vary materially a very different and by no means satisfactory result will be obtained. Of 86 powders examined lately, but 53, or 62 per cent, were of satisfactory quality. A firm in this city (Brooklyn) has advertised in the pharmaceutical journals seidlitz powders called "regular," containing but two drachms instead of two drachms and two scruples of the seidlitz mixture in the blue paper, which is exactly 25 per cent short weight. If this be regularity, it is certainly without scruples! These powders are advertised at a price two dollars a gross less than that charged by the same firm for "full weight" powders, giving those druggists who desire to buy cheap goods without regard to quality, an opportunity to effect a small saving. This is one of the comparatively few cases that have come to my notice, of intentional and openly advertised fraud of this kind.

IV. *Articles of excessive strength.*

Pharmacopœial articles of excessive strength, probably from careless preparation, are by no means uncommonly met with. We find them among the diluted acids which are sometimes two or three times as strong as they should be. Spirit of nitrous ether, made from "concentrated nitre," is not infrequently considerably above the proper strength, and tincture of iodine and compound solution of iodine are occasionally so. Solution of hydrogen di-oxide has been found of excessive strength in a few instances, but it is generally of a very satisfactory quality according to our experience, 14 samples out of 83 only falling materially below the pharmacopœial limit of three per cent.

V. *Substitution.*

This is by no means uncommon. It is often the result of ignorance, but is sometimes intentional. Saffron furnishes an example. The pharmacopœia recognizes but one kind, namely, the stigmas of *Crocus sativus*, and there is no need that this should be designated by such terms as "true saffron" or "Spanish saffron," yet when saffron or crocus was called for, in 109 out of 133 cases, or 72 per cent, common safflower was sold in its stead. Safflower is very cheap and is often called for, verbally, as a domestic remedy under the name of saffron; but when the demand is for the pharmacopœial drug, it should not be dispensed. At all events, if offered in its stead, the substitution should be explained; but no such explanation was made in any of the above cases.

The pharmacopœia of '80 recognized two kinds of ether, viz.: stronger ether and ether, but the latter has been dismissed in the revision of '90. The former, being the present and only ether of the pharmacopœia, should contain about 96 per cent of absolute ethyl oxide, and have a specific gravity of from 0.725 to 0.728 at 59 degrees F, while the latter, or "ether" of the preceding pharmacopœia, contained about 74 per cent, and had a specific gravity of about 0.750. Some confusion has resulted from the change in nomenclature, but

the pharmacist ought to be informed upon these subjects and know that the "æther" of the present pharmacopœia practically corresponds to the "æther fortior" of the preceding one. Of 523 samples examined, but 292, or 56 per cent, were of proper strength and quality. Such a result indicates great carelessness or ignorance, but unfortunately many druggists, having received little systematic training, have never acquired the habits of exactitude and precision which their business demands. When articles are called for by their correct pharmacopœial names, they should be furnished or no sale made, and common ether, or the so-called "washed ether" should not be substituted for the pharmacopœial article, nor should the term "sulphuric ether," which was always a misnomer, and is not recognized by our pharmacopœia at all, ever be applied to it.

Creosote, by which the pharmacopœia means "a mixture of various phenols, chiefly guaiacol and creosol, obtained during the distillation of wood-tar, preferably of that derived from the beech," is an article for which so-called coal-tar creosote, or carbolic acid, is often substituted. Of 312 samples examined, only 165, or 53 per cent, were real creosote. Although these substances resemble each other in some respects, they differ, very materially, in many others, and the substitution is entirely unwarranted and inexcusable.

Distilled water is seldom sold of good quality. Of 21 samples examined, none complied with the pharmacopœial requirements. They yielded on evaporation from 2.2 to 23 parts of total solids per 100,000 and evidently most of them consisted of impure rain water, or mere tap water, not even filtered in all cases.

Washed sulphur is often replaced by common sublimed or "flowers of sulphur." Of 157 samples, 112, or 71 per cent, were of good quality, the remainder possessing all the acidity which ordinarily characterizes common sulphur.

Solution of magnesium citrate is a favorite, efficient and agreeable saline laxative, but it has been largely sophisticated by manufacturing chemists. In order to lessen the cost of

production, an effervescing solution of sodium tartrate, made in various ways, sweetened and flavored to imitate the real article, is frequently sold in its stead and under its name. Such fraudulent articles have very little medicinal value. Of 14 samples which I examined some years since, being of different makes, no less than six were spurious.

VI. *Errors in sale.*

In a sense, every incorrect sale is an error, but our classification is not very precise, and under this head I will instance a few of the blunders that are occasionally committed by the substitution of a wrong article, with perhaps a somewhat similar name, for the one called for. For crocus (saffron) "*Crocus Martis*," or sesqui-oxide of iron is sometimes dispensed, and for reduced iron the same oxide, formerly pharmacopœial under the name "*subcarbonate*," is, occasionally sold. Magnesium carbonate, as we have seen, is very often sold when magnesia is called for, and in place of the diluted acids the strong acids are sometimes supplied. In the case of the mineral acids this may be a very dangerous error. Tincture of iodine is sometimes sold for the compound solution, and vice-versa, and other blunders not less inexcusable are occasionally committed, which would be laughable if they were not sometimes so hazardous in their possible results.

Now let it not be thought that all drugs are likely to be of as unsatisfactory quality as those which have been selected for purposes of illustration this evening. Let the fact, already stated, be remembered that these samples by no means represent the average of drugs sold in the stores. A very large number indeed of drugs and pharmacopœial preparations are practically never adulterated or of inferior quality in any material respect. Crude vegetable drugs are to be found in the market of all grades of quality, but there is little intentional substitution or adulteration, and powdered drugs, like ipecac, opium and rhubarb are generally of satisfactory quality, and, on the whole, much better, I think, than they were a few years ago. Nothing has been said of alkaloidal

preparations, for the subject would require more time than we can give it, but short weight pills of quinine and morphine, and citrate of iron and quinine deficient in quinine, are not, according to my experience, so commonly met with as they were a few years ago. The newer remedies which chemistry has given to medicine, like acetanilid, phanacetin, antipyrin, sulphonal and the like, are generally of good quality, and we have found that alcohol and the distilled liquors, iodoform, calomel, glycerin, potassium chlorate, santonoin and many other commonly employed medicines are generally at least of satisfactory purity. It should also be borne in mind that the articles referred to this evening were purchased at stores of all classes in both city and country. A first-class city pharmacy with a full and fresh line of all goods could not be supported in a small place, and over competition makes the matter still worse. If one attends a village church he does not expect to find a Spurgeon in the pulpit, nor do we look for a Willard Parker nor a Loomis, when we summon the country doctor, and if we wish to be sure of obtaining the best drugs and most carefully and elegantly prepared prescriptions, we should not ordinarily select the village drug store. In some European countries the laws regulating the professions are so rigorous that physicians and pharmacists are few and far between, since a man who can afford to fit himself for license cannot afford to practice his calling in sparsely settled communities. In this country the case has been, and still is, very different. We probably have more doctors and druggists than the needs and best interests of the public require, but in a country so new and so large as ours, this has been the preferable condition. The rude country doctor has made a living and been satisfied to stay where his fully trained and university-educated brother could not be induced to reside, and he has often been a god-send on the outskirts of our civilization. He may have made mistakes, but a man with some knowledge of medicine is often better than none, and so with the druggist—a poorly equipped store may be much better than none at all. As our

population becomes denser the demands of the public will increase, and our legislation will become more stringent and our laws be better enforced. Let us not be unreasonable. Great reforms cannot be effected in a day. Water will not rise above its source, and we cannot make men perfect by any kind of legislation nor raise the standard either morally or intellectually of the workman or professional man above the general average in the community by the passage of laws. The evolutionist who believes that all things are developing in an orderly manner and in accordance with general laws is not likely to be over-sanguine on the one hand, nor easily discouraged on the other. He will judge the future by the past, and will see that all great reforms have been the natural outgrowth of preceding conditions which have prepared the way for them. If he feels called upon to act as a prophet or propagandist he will do all that in him lies to warn and to instruct his fellow men and he will labor unceasingly to hasten the day when the reforms for which the whole world waits shall be effected, but he will not over-estimate the value of legislation, nor believe that men can be made wiser or better at a bound by passing laws. He will see that as the general education of the masses of our people is bettered; as the standard of teaching in our professional and technical schools is raised; as the state lends further aid to the work of education, and as the moral sense of the people is awakened, and the recognition of the mutual responsibilities of the citizens of the state becomes general, the improvements for which so many now make an untimely demand will be brought about—not by a sudden revolution, but by a natural expansion and progressive movement.

And so I appear before you this evening not as the fault-finding and unreasonable critic of the pharmacist but, in a sense, as his apologist. The state board with which I am connected is sometimes criticised because it does not rigorously prosecute offenders under the law. I have already taken so large a share of your time that I will enter upon no extended explanation of its work or defense of its policy, but

I wish, in conclusion, to express the opinion that by exposing abuses, correcting errors and informing dealers and the public at large, the work which it has done has been of far-reaching influence and of great value in improving the quality of the drugs sold in this state. It has received the hearty support of leading pharmacists and is in line with the work being done by our pharmaceutical journals and associations, our colleges of pharmacy and pharmacy boards, and while I would not deny that cases exist in which stringent measures might perhaps be taken with advantage for the correction of certain of the more glaring abuses, I do not believe that any general onslaught upon manufacturers or dealers is necessary under existing circumstances, or that such a course would receive the moral support of the people without which, laws, however good, can seldom be enforced. Druggists as a class are not less intelligent and honest than are men engaged in other pursuits. True, their responsibilities are often greater, and the nature of their business is undergoing a change to which they do not always readily adapt themselves, but it is my belief that for the most part they desire to conduct an honorable business in a legitimate and in an upright manner, and that the errors they commit are due more frequently to carelessness or ignorance than to deliberate intent to deceive or defraud. I believe that for the most part they are ready to rectify their mistakes when informed of them, and that the warnings they receive, and the publicity given to the errors they commit, generally furnish sufficient incentive to lead to their correction. And therefore I have little sympathy with the sensational revelations that are made in a spasmodic way from time to time by the newspapers and, occasionally, by state officials. They are so often exaggerated and unjust that they accomplish little good and sometimes do much harm. They cast reproach upon a reputable body of men, and the motives which instigate these exposures are not always above suspicion. The cause of sound pharmacy will not be advanced by sensational disclosures in the public prints and only as, by gradually effected changes, we weed

out the incompetent or restrict their privileges, and put a premium upon competency and ability, and secure for those who enter upon this calling a better training for the work, and magnify its importance and its responsibilities, can we hope to raise the standard of American pharmacy to the high plane which it should deservedly, and in my belief will eventually, occupy.

Some Points in the Anatomy of the Kidney.

BY JOSEPH D. CRAIG, M. D.

In introducing the discussion laid out for the meetings of this society for this winter, on kidney lesions, by a paper on the gross anatomy of the kidney, I have thought it wise to direct especial attention to some of the more important elements and varieties of structure and relations, rather than to follow the beaten track of text-books on descriptive anatomy. The brief consideration of these will prove to be, I think, of both interest and profit. The normal and usual form, size, color, weight and relations of the typical kidney, as well as their smaller and unimportant variations, are sufficiently well understood, in a practical way, by the general practitioner, to warrant us in leaving them out of consideration. To even recapitulate them would carry this paper beyond the limits of time which properly and necessarily can be given to it.

We will therefore consider in the first place, the peculiar anatomical variations in relative arrangement of tissues which form the floating and movable kidneys. There is very much confusion of thought in the use of these two terms. I think it convenient and proper to intimately distinguish between them, reserving the term floating kidney exclusively for such as are closely surrounded on both surfaces, with only the fatty capsule between, by peritoneum, which also covers both extremities and outer border, leaving only an attachment along the inner border to the lateral borders of the abdominal structure in immediate

relation to the spinal column. Of course, the ureter and tissues both blood vascular and lymphatic systems will be found within the two layers of this detached portion. In this way, the kidney will be held to the underlying structure by its double fold of peritoneum or mesonephron just as the small intestines are held to the supporting tissues behind them by their mesentery, and also like the small intestines, the variety and extent of motion of such kidney, will depend altogether upon the length of its mesonephron. Movable kidneys, then, will be such as are capable of more or less movement while still behind the peritoneum. This distinction of terms, however, is not always used; perhaps, I ought to say, is not usually made. At one time the expressions, floating and movable kidney, are said to be synonymous terms, interchangeably used, and expressing only different degrees of motion; at another, it is held that while in movable kidneys the fatty capsule always surrounds the viscus and moves with the urinary gland, in floating kidney, the gland has broken through the surrounding fatty tissue and so is free to change its position within sometimes wide limits within the peritoneal cavity. The distinction which makes a floating kidney one in which the peritoneum completely surrounds the gland and the movable kidney one which remains behind the investing layer of the abdominal viscera I will use in this paper.

The floating kidney is primarily a variation of normal anatomical relations and only under certain circumstances becomes pathological, just as the vermiform appendix has a great number of normal anatomical variations and only occasionally puts its possessor at the mercy of the surgeon's knife. Perhaps I ought to say, in passing, that the kidneys and the appendix are not the only viscera within the abdominal cavity which show a tendency to depart from the normal type. The liver, the spleen and intestines all vary from the descriptions found in text-books of anatomy—such variations being of course due to differences in development. As an illustration, I can say that the peritoneum which I

have studied with care in many subjects in the dissecting room of our college rarely shows throughout its entire extent conformity to type.

I have been looking in the dissecting room quite diligently for two years for a floating kidney, as I have defined it, and as yet have not discovered one, or even one in which a small fold of peritoneum was tucked in behind the outer border of a kidney. These kidneys are excessively rare and there are only a very few authenticated records of them. The arrangement of tissue is of necessity a congenital one, the mesonephron as it grows into the kidney proper, becomes invested with peritoneum in foetal life and persists to adult life. Such an arrangement of peritoneum about the kidney does not of necessity appear on both sides in the same subject, but usually only on one; the left side having the arrangement more often than the right. I know of no recorded cases of floating kidney on both sides in the same subject. In the rare cases in which floating kidney is found, if the mesonephron be of sufficient length they may be found in almost any part of the abdominal cavity from the diaphragm to the pelvis and from the costar-colic ligaments to the hilum of the liver. The floating kidneys are scientific curiosities and of little practical importance. They are so excessively rare that they may be excluded from the diagnosis in any examination of the abdomen for suspected disease.

Movable kidneys, however, are quite common and it has been my experience in the dissecting room that a large proportion of the kidneys which are there seen are more or less movable. But as practical men only such kidneys should be considered as movable as might at some future time, by a twisting or turning, so interfere with their nerve or vascular supply as to endanger the integrity of their functions of nutrition or excretion and thereby lead to pathological changes. There seem to be two elements in the causation of this condition. Remember that I am speaking only from the normal anatomical standpoint and not at all from a pathological one. Such elements of causation as trauma-

tism, tight-lacing or hydronphrosis I have nothing to do with in this introductory paper. The first element of causation depends upon a congenital arrangement of tissue whereby a full play of the kidney is permitted so far as its position behind a somewhat loose peritoneal membrane will allow. I do not think it possible to explain just how or why this movement is permitted. To use a common expression, persons in whom such kidneys are found are simply built that way. The second factor is the loss of support which is taken away from the kidney in those persons in whom an abundance of fatty tissue at some previous time characterized the fatty capsule, but later had to a considerable degree disappeared. In these cases the peritoneum pushed far forward at first, never afterwards approximates closely to the kidney and thus considerable space is left for free movement of the underlying urinary viscus. Both kidneys may be freely movable, but usually only one is so and it is more common to find the right kidney movable than it is the left. Movable kidneys are also more common in women than in men. The widest recorded latitude of movement of which I am familiar is one along a diameter of nine inches. Movable kidneys have moved so far from their normal position in recorded cases as to be found on the side opposite to that to which they belong and even as low as the sacro-iliac syncondrosis or even within the pelvis, while in some few cases so lax has the peritoneal covering become that it can be folded over both sides of the gland.

It is not the province of this paper to deal with the subject of diagnosis, but this much ought to be said, that diagnosis of floating or movable kidney without marked concomitant symptoms pointing immediately to that organ is made with the greatest difficulty and such diagnoses should be treated with suspicion until the subject had been cleared up at an autopsy. It is so easy to make mistakes here. I think we have all seen or heard of so-called movable kidneys resolving themselves into carcinomata or other tumors of adjacent organs, particularly the stomach, and omentum

when opportunity was offered to prove the truth on the post mortem table.

There is another interesting form of kidney variation, or anomaly if you prefer to call it so, in which a kidney in all other respects normal is found to vary markedly in its position from the common type. The displacement is almost invariably below the usual location. Kidneys thus varying in position are found anywhere along a line drawn upwards upon the abdominal wall from the middle of Poupart's ligament to the tip of the eighth costal cartilage. This line, which in part marks out the regions of the abdomen, I prefer to draw from the middle of Poupart's ligament to the tip of the eighth costal cartilage, rather than from the middle of Poupart's ligament vertically upwards, for the reason that a line so drawn will in the vast majority of subjects more nearly divide the abdominal wall into regions whose contents conform more nearly to the book description. The vertical line will pass sometimes to the outer side of the outer border of the kidney; at others at a variable distance along its anterior surface, while the other line more nearly maps out the kidney surface into two zones, the outer one containing one-third and the inner one two-thirds of the kidney structure. These displaced kidneys so called, may, moreover, be found resting upon the sacro-iliac synchondrosis in the iliac fossa or even within the pelvis. Such extreme displacements as these latter are very rare and any of us might make thousands of autopsies without finding one as low as the pelvis. Such so-called displacements however are on record. This arrangement is invariably a congenital one and the renal arteries do not spring from their usual position high up on the sides of the abdominal aorta, but come from larger trunks nearer at hand from the iliac common, external or internal, the mesenteric, or the abdominal aorta just before its bifurcation. The veins also enter venous trunks near by and the ureters are shortened and their course various and occasionally slightly tortuous. Of course from the anatomical standpoint the term displace-

ment is a misnomer. We would think of kidneys once in their normal place "displaced" by some external violence or internal strain. That of course is not the idea. A kidney such as I have just described and called a displaced one is as much a normal kidney in the subject in which it is found and does its physiological duty as thoroughly and well as if it were in its more usual relations. Two cases are, however, on record in which kidneys normally placed so far as function was concerned just within the brim of the pelvis interfered decidedly with the progress of labor.

I must not fail to mention in this paper of suggestions, the variations in size and weight within normal and physiological limits. We usually think of a kidney as a structure about four inches or a little more in length, two or two and a half inches in breadth and an inch or an inch and a half in its thickest part and weighing from four to six ounces, and the two kidneys taken together as to 240 of the entire body weight. Of course the weight and size of a kidney removed from a body does not help us very much in determining the question of disease unless the variation is rather considerable and unless there be other confirmatory signs suggested by color, consistency or appearance. Thus, a kidney weighing four ounces might be a normal kidney or a kidney which normally weighed six ounces and afterwards had become somewhat contracted. But in addition to variations which come from pathological changes, important differences in size arise from a perfectly normal condition, this change being due to influences which have been operative during the stage of development. On one side of the body we may have a kidney in size all the way from the normal standard to one so small that it can be scarcely appreciated, or even the kidney may be found entirely wanting, while that on the other is relatively increased in proportion until in the extreme case of absence of kidney on one side, the other is just about double the size of a kidney conforming to the normal type of the books. The total amount of kidney tissue in both organs combined in such cases, as determined by weight, do not

depart very much from the total of tissue which would be expected if both were of normal size. I am not speaking of cases in which one kidney is diminished in size or completely atrophied from pathological conditions, while the other is vicariously enlarged and does increased physiological duty in compensation for the loss of secreting substance on the other side. I speak only of kidneys varying in relatively normal anatomical quantity of tissue. I found last winter in the college dissecting room a perfect illustration of this variation. One kidney was less than half the size of an ordinary one, while the other was correspondingly large. Not feeling quite sure that my supposition was the correct one and fearing that some pathological change was responsible for the condition, I referred the matter to a professional friend of larger experience who confirmed my belief that this was truly a case of normal anatomical variation in size.

If course small variations in size are relatively common, extreme variation proportionately rare, it is well to keep these facts in mind while making autopsies.

It would be possible to prolong this paper to a great length and still maintain the interest which many of us have in this subject. We might spend a profitable evening perhaps in considering the variations in the fatty capsule and the consequent influence on the induction of pathological changes in the kidney; or the question of third and supernumerary kidneys, might form an interesting topic for consideration, or the fibrous capsules with the muscular coat beneath might engage our attention and we might estimate how near a kidney would be restored to normal shape by the contraction of their muscular fibres, simple or hypertrophical, compensatingly in a hydronephrosis, which had not existed long enough to induce permanent pathological changes. The arteries enter the kidney substance in many curious and interesting ways, and the ureters and pelves are sometimes double and occasionally a ureter may be triple. We have only time for a passing reference to them. The limits necessarily set for such a paper as this

forbid me from considering but one more of these peculiar and uncommon departures from the common type.

In conclusion I will mention, briefly, the odd ways in which the kidneys of the two sides are sometimes more or less fused together. In about one in every 1,500 autopsies, the kidneys are united across the middle line and present an appearance resembling a horse shoe, from which they receive their name. The bond of union may be true kidney substance or white fibrous connecting tissue, the capsules only in these latter cases being connected together. Usually, the union is along the lower portion of the inner surfaces, just below the hilum—in these cases the concavity looks upwards. In some few cases, however, the fusion is along the upper part of the inner surface and above the hilum, and in these cases the concavity, of course, looks downwards. The bond of union is across the middle line of the body, in front of the great blood vessels and behind the peritoneum, intestines or other viscera depending a little upon the position of the point of connection. In some cases the connection is along the entire inner border, making a disk shaped kidney either resting on the middle line or on one or the other side. These kidneys have, usually, true pelves and ureters and two sets of vessels, but sometimes there is only one set of blood vessels and one pelvis. The ureters of course will run an unusual course. Fused kidneys forming disks are found once in 8,000 autopsies, and when we consider the great number of autopsies made yearly, it seems strange that more of these cases are not on record. If I find either a fused or floating kidney in the college dissecting room I will surely present it here. I have hopes, that with due diligence, I may yet find both. Now, there is still another form of these fused kidneys; one kidney may pass to the opposite side and be firmly united by a bridge of true kidney substance, and when kidneys are so united and at the same time are markedly lobular, as they sometimes are, the mass presents a peculiar and puzzling object indeed.

In gathering together the details of this paper you will notice perhaps that two things stand out very clearly: one is that the floating, the fused and the so-called displaced kidney are departures from the normal anatomical standard and are in no sense of the word pathological; and the other is that these departures from normal standards are invariably congenital and due to causes which are beyond our knowledge. They exist in the body without detriment to the organism and the physiological function in each case is thoroughly and normally performed. A little later in the year we may perhaps learn how they, as well as kidneys normally situated and in normal relations, take upon themselves medical or surgical pathological changes.

I trust that I may have contributed something of interest at least to the society and that this paper may have rendered clearer our knowledge of the anatomy of the kidney as a preparation to the more important studies which are to come.

Report of One Hundred and Forty-Five Operations Done for the Removal of Ovarian Tumors and Pathological Conditions Associated with the Ovaries and Uterine Appendages Only.

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CONTINUED FROM PAGE 117.

An abstract of this paper was read at the meeting of the American Association of Obstetricians and Gynecologists, Toronto, Canada, September 19th, 1894.

CASE CV.—Mrs. E. E., mother died consumption, otherwise family history good. Patient healthy as a girl. Menstruated at thirteen; regular, menopause seven years previous to operation at forty-seven years of age. About a year previous to operation ailing, and during past six months grew larger, but able to walk and lie down comfortably until six weeks ago. Since noticing tumor bowels constipated; ankles never swollen. Diagnosis multilocular ovarian cyst. Coeliotomy September 25, '93. Large multilocular ovarian cyst; tapped and removed with ovary right side; twenty pints fluid removed. No drainage. Patient did well and discharged sixteenth day. Good health August, '94.

CASE CVI.—Mrs. I. A., family history good. Oldest child nine years of age had it lived. When seven months pregnant taken sick and had convulsions, followed by abortion and child born dead. Youngest child three years and seven months old. Menstruation always regular. '89 noticed abdominal enlargement which steadily increased. Tumor when first seen large as hen's egg and movable when lying down. Cœliotomy September 28, '93. Multilocular ovarian tumor; fourteen quarts fluid, dark, gelatinous coffee-colored, removed, also tumor, right and left ovary. Drainage. Patient did well and discharged twenty-first day with no unfavorable symptoms.

CASE CVII.—Miss E. E., aet twenty. Two years previous to operating suffered much pain in left inguinal region; mental condition not at all good; tendency to melancholia. Spring, '93, found to be suffering from ischio-rectal abscesses, with fistulous tract, also an opening into the vagina discharging pus. Very severe case of vaginitis, requiring thorough operation. Good recovery with exception of sinus connecting with vagina. Mental condition such that later oöphorectomy resorted to. Cœliotomy October 4, '93. Left ovary diseased, double pyosalpinx; removal uterine appendages. Patient made a good recovery, some improvement in general condition. Sinus in vaginal wall left side, healed. June, '94, not fully improved in mental condition.

CASE CVIII.—Mrs. M. S., family history fair. Patient well, exception attacks of neuralgia, until marriage. Three children born, one alive. Four miscarriages, last, summer '92. Very ill during parturition. Menstruated at twelve, and during pregnancy after third month up to confinement. Regular since curetted, July 26, '93. Six weeks previous to operation had peritonitis, keeping her bed, almost continuously. '91, Dr. Boyd operated, she thinks, for lacerated perineum. June, '93, some intestinal obstruction, bowels not moving for three weeks. Cœliotomy October 7, '93. Both ovaries and tubes removed, latter adherent and right one cystic. Right tube in a condition of pyosalpinx. Patient convalesced nicely, although drainage was necessarily kept in lower end incision for over four weeks, owing to abscess that formed at that point. Discharged November 30, '93. Good recovery. Patient obliged to go to work at once. September, '94, presented with threatened hernia.

CASE CX.—Mrs. J. M., aet forty, married, two children, suffered from severe attack of pelvic peritonitis, with suppuration; confined to bed several months at a time. an invalid more or less past five years. Cœliotomy October 12, '93. Case double pyosalpinx, with atrophy ovary left side; right enlarged. Quite a number of adhesions. Removal uterine appendages. Patient made a quick and good recovery. Discharged from private hospital, November 8, '93.

CASE CXI.—Mrs. I. DeL., mother died heart disease and phthisis, otherwise family history good. Patient healthy as a girl. Menstruated at fourteen; never regular, and attended with pain. At twenty fell down stairs, hurting back. Three days after large passage blood from rectum. Ill for three weeks, and never strong after. '83 chair pulled from under her and worse since. Married twenty-three years; no children; no miscarriages. After last acci-

dent noticed tumor, supposed to be connected with uterus. First observed when using syringe taking vaginal douche. Under treatment tumor disappeared for three years. September, '92, reappeared, attended with very severe pain. Cœliotomy October 15, '93. Diseased ovary left side; double pyosalpinx. Removal uterine appendages. Recovery. Discharged November 18, '93. June, '94, doing very well.

CASE CXII.—Mrs. H. M., aet thirty-six, family history cancer and tuberculosis. Confined to bed at sixteen with bowel complaint for some time. '91 began to flow more than usual, told she was pregnant, but passed term of confinement, when Dr. Rossman, of Ancram, N. Y., told her she had an ovarian tumor, which did not enlarge rapidly. October, '92, came to hospital, by advice physician, remaining for a short time. Distinct fluctuation right side abdomen, from pelvic region up. Owing to her feeble condition did not operate, but drew off about two quarts fluid. Repeated two or three times during following year, patient gradually improved, and grew stronger, although flow irregular. Diagnosis double ovarian cyst, possibly associated with a fibroid. Cœliotomy October 21, '93. Double multilocular ovarian cyst, fibroid size cocoanut connected with fundus of uterus, interstitial. Uterine artery secured; broad ligament tied in sections. No clamp; few adhesions. Operation one hour and fifty minutes. Fourteenth day lower end wound opened and quite a portion of pedicle with two silk ligatures came away. Some discharge of pus for ten days. Sinus packed. Recovered and discharged on twenty-seventh day. Doing nicely, March, '94.

CASE CXIV.—Miss M. N., aet thirty-one, family history good. Menstruation very irregular. '93 noticed growth in left side abdomen. Diagnosis of multilocular ovarian cyst. Symptoms increased, and cœliotomy done October 30, '93. Double ovarian cyst, multilocular. One contained about ten pints fluid, the other not so much. Large fibroid of uterus; removed by supravaginal hysterectomy. Tait clamp. Good recovery; discharged December 23, '93. Patient came under observation December, '94, with sarcoma of the pelvis and implicating sigmoid flexure. No operation possible.

CASE CXV.—Mrs. M. C. P., family history fairly good. Patient always healthy as a girl. Menstruated at thirteen; never regular, but painless. Married three years; one child fourteen months old; no miscarriages; menstruated when child was six weeks old; then flow ceased, reappearing April, '93. Never noticed enlargement abdomen herself, but physician told her she had some trouble. Thought at first she was pregnant; never in pain, and in good health all summer. Cœliotomy November 2, '93. Small ovarian cyst, left side; tapped with aspirator; both ovaries removed; right cirrh recovery; discharged nineteenth day. In good health June, '94.

CASE CXVI.—Mrs. S. H., aet twenty-six, history of two years' illness; well-marked attacks pelvic peritonitis, pelvic abscess, cystitis, pus in urine, evidence pyelitis left kidney, accompanied with vomiting. In New York hospital for several months. Saw her September, '93, but she was so feeble and emaciated I did not feel an operation could possibly be done. Under treatment she improved, and cœliotomy done November 2, '93. Double pyosalpinx, previously diagnosed. This confirmed, and appendages removed. Patient recovered, end of second week, when obstruction of bowels presented, partially relieved at times, but she died from exhaustion November 29, '93. No autopsy. I believe that here was a case of obstruction due to adhesions between the small intestines and surface of pedicle, possibly peritonitis only.

To be Continued

The Great American Drink.—The *Philadelphia Star* prints the following interview with Mr. Low, of Washington: “You ask what is our national beverage,” said Mr. Low. “Perhaps you would say whiskey or beer, but you would be away wide of the mark. Soda-water is what I am talking about, and I speak advisedly when I call it the great American beverage, for it has certainly become the national drink. In the first place it is a peculiarly American tippie. I came across one fountain in Venice; London has three, and perhaps in the rest of Europe there may be a dozen. The amount of capital invested in the trade all over the United States is enormous, running far into the millions. That it is a lucrative business goes without saying, for else how could men afford to pay \$4,000 and \$5,000 for the huge and ornate affairs from which the pleasing ‘soft stuff’ is drawn.

“A New Orleans man, named May, told me that his yearly profits from his fountain were \$30,000. Mr. Sanders, of Detroit, who owns an \$8,000 fountain, the finest displayed at the World’s Fair, does a rushing business, and his sales run from \$300 to \$700 per day the year around. Evans, who runs three drug stores in Philadelphia, and who is one of the leading druggists in the country, does an enormous soda-water trade. In Buffalo, Stoddard Brothers employ thirty girls to handle ice cream soda, and it takes 3,000 glasses to accommodate their trade. They sell it at five cents per glass, and there is a net profit of just 100 per cent. In Boston, Thompson’s Spa, the greatest soda resort at the ‘Hub,’ easily clears for its owner \$50,000 a year. There are in the United States 100,000 fountains in operation, and manufacturers are getting more orders now than they ever got before.”

Another Boom for Homeopathy.—Shahzada Nasrulla Khan, the hopeful scion of the royal house of Persia, who has been perturbing all official and fashionable London by his disregard of the conventionalities, has decided not to take advantage of the Ameer’s permission to remain in England until September—whereat there is much rejoicing among his perforce hosts. According to cable dispatches, his decision is due to an encounter with various evil omens, including a wild ass at the zoological gardens which brayed without ceasing, at his approach, and refused to be comforted.—*Similia similibus curantur.*

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HOWARD VAN RENSSELAER, PH. B., M. D., EDITOR.

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ANNOTATIONS.

Source of Error in Fehling's Test for Sugar.—Lafon reports the case of a woman who excreted 183 grams of sugar in twenty-four hours; the sugar disappeared after some months of treatment, and the patient had been taking medicinal doses of sulphonal (.75 to 1 gram) for two months. In the urinalysis, after ingestion of sulphonal began, Lafon always found a decided precipitate of yellow oxid of copper by boiling with Fehling's solution, which, without any other precautions would indicate the presence of sugar. These same specimens of urine examined by the polariscope gave no deviation to the right, characteristic of diabetic sugar; but, on the contrary, turned slightly to the left, almost inappreciably. Some twenty specimens of urine were examined, and in all, Fehling's solution clearly showed the supposed presence of diabetic sugar, while none was present by the polariscope test. The reaction of Fehling's solution is not due, at least in the majority of cases, to the

products of the transformation of sulphonal in the economy, for the addition of a medicinal dose, one gram per liter to urine absolutely free from sugar gives exactly the same reaction. As sulphonal is somewhat largely used, this fact, which is not mentioned by any writer on the drug, is worthy of note.—*The Journal*.

Formaline as a Preserving and Hardening Fluid for Histological Purposes.—(G. Bergonzoli, *Bulletin Scientifico*, 1894, No. 1, page 18). Formaline or formal, in solution concentrated to forty per cent of formaldehyde, is a limped liquid, slightly opalescent, neutral or slightly acid, of a characteristic pungent odor. The antiseptic properties of formaldehyde have been studied by Loew (1886), Aronson, Berlioz and Trillat. The author has found from his observation that solutions of formaline are deodorant and disinfectant; that pieces of tissue immersed in it are rapidly fixed and hardened, and only shrink to an almost imperceptible degree. The color is perfectly preserved, only the coloring matter being dissolved. For nervous tissue it is excellent. Formaline has the advantage over alcohol, that it is not inflammable and is much cheaper.—*Rev. Internat. de Biblog. Med.*

Turpentine in Post-Partum Hemorrhage.—Dr. N. Mayne, in *Trained Nurse*, says: "For some years I have used spirits of turpentine in post-partum hemorrhage and in every case with the best results. When the ordinary means, i. e., friction over the uterus, irritation of the uterus by introduction of the fingers; cold, hypodermic injection of ergotin, etc., failed, by saturating a piece of lint with the turpentine, and introducing it in my hand into the uterus, and holding it against the walls, rapid contraction took place, and all hemorrhage instantly ceased. In one or two cases, when the patient was almost pulseless, it seemed to act as a stimulant. On no occasion did this action fail or did it cause the slightest inconvenience, except in one, when the side of the patient's thigh was slightly blistered by some that came in contact with it, but it gave very little annoyance.

I consider it is much quicker and surer in its action than any other remedy, and does not cause any injurious result, and is much more easily applied. In country practice, getting hot water or using injections, often means loss of time.

REVIEWS AND BOOK NOTICES.

A System of Legal Medicine.—BY ALLAN MCLANE HAMILTON, M. D., Consulting Physician to the Insane Asylums of New York City, etc., and LAWRENCE GODKIN, Esq., of the New York Bar. Illustrated, Volume 1. New York, E. B. Treat, 5 Cooper Union, 1894. Price \$5.50.

This system of Legal Medicine is the most important contribution to medical jurisprudence that has appeared in the English language.

The two large volumes, each of which consists of over six hundred pages, embrace every subject in which medicine comes in contact with the domain of law.

All the articles are written by experts, either eminent judges or lawyers on the one hand, or specialists of the medical profession on the other.

The subjects covered by the first volume, which as yet is the only one that has been published, are as follows: Medico-Legal Inspections and Post-Mortem Examinations, Death in its Medico-Legal Aspects, Blood and other Stains-Hair, Identity of the Living, Identity and Survivorship, Homicide and Wounds, Poisoning by Inorganic Substances, Poisoning by Alkaloids and Organic Substances, The Toxicologic Importance of Ptomaines and other Putrefactive Products, The Medical Jurisprudence of Life Insurance, Accident Insurance, The Obligation of the Insured and the Insurer, Of Certain Legal Relations of Physicians and Surgeons to their Patients and One Another, Indecent Assault upon Children.

Each topic treated is considered with the greatest accuracy and scientific precision, and is consequently a trustworthy guide, and one thoroughly to be recommended.

The book is illustrated with plates wherever desirable, some of which are colored; and the work of the publishers leaves nothing to be desired.

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Surgical Kidney—Its Etiology and Pathology.

BY GEO. M. STERNBERG, M. D., L. L. D., SURGEON-GENERAL
U. S. ARMY.

The term “surgical kidney” is not a happy one and has been used to include several different pathological conditions; but recent authors commonly restrict the use of the term to cases of suppurative pyelonephritis, and it is to this class of cases that we have reference in the present paper. It is safe to say at the outset that suppurative inflammation of the kidney, like suppurative inflammation elsewhere, is due to microorganisms. But in considering the etiology of the disease we have to take into account certain other factors which are also essential, inasmuch as pus-producing microorganisms are not found in the healthy kidney or in the bladder, and a suppurative inflammation in the organ must depend upon their introduction from external sources, or from infected foci in other parts of the body. According to Delafield,* suppurative nephritis may be due to emboli. But this is comparatively rare and by far the greater number of cases are secondary to cystitis. It may also result from injuries, such as gunshot, incised or punctured wounds involving the kidney or the bladder. The presence of calculi in the pelvis of the kidney is a predisposing cause, just as the irritation produced by the presence of calculi in the bladder constitutes a predisposition to cystitis. But the cystitis or the

* Twentieth Century Practice of Medicine, Vol. I, p. 103.

ascending inflammation which ends in suppurative pyelonephritis do not occur unless in some way pus-producing microörganisms are introduced into the bladder. It is hardly necessary to refer to the fact that cystitis is commonly secondary to conditions which call for the introduction of instruments to the interior of the bladder, such as urethral stricture, enlarged prostate, vesical calculi, retention from paralysis, etc., and the manner in which pus-producing microörganisms are likely to find their way to the interior of the bladder in such cases is too apparent to call for any special comment. The best methods of preventing this serious misfortune do not at present concern us. But it should be remembered that a sterile instrument may convey to the bladder bacteria from the outer extremity of the urethral canal, where they are always present in considerable numbers. In the perfectly healthy urethra they are only found in the immediate vicinity of the meatus urinarius, but in cases of chronic urethritis pus cocci and other bacteria are present in great numbers upon the surface of the inflamed mucous membrane and in the more or less purulent discharge from the urethra. It is evident, therefore, that the careful sterilization of instruments does not insure the exclusion of pyogenic bacteria when such instruments are introduced into the bladder.

Fortunately the introduction of these pus-producing bacteria into the healthy bladder does not produce any evil results. Their multiplication in normal acid urine is not rapid, and they are quickly washed away by the renal secretion. But when the mucous membrane of the bladder has been injured by the introduction of an instrument, or is irritated by the presence of a foreign body, or when there is obstruction to the free exit of urine, or atony which prevents the complete discharge of the contents of the viscus, pyogenic microörganisms may affect a lodgement. And if the obstruction or paralysis, or irritation from the presence of a foreign body are not relieved we are likely to have a chronic cystitis and eventually an ascending pyelonephritis. What has been

said is sufficient to show that a discussion of the etiology of "surgical kidney" involves a discussion of the exciting causes of cystitis.

The statement that the introduction of pyogenic bacteria into the healthy bladder is unattended with any evil results is supported by experiments upon the lower animals. Thus Rovsing (1890), who has made elaborate researches upon the bacteriology of chronic cystitis, found that pure cultures of various bacteria obtained from the human bladder in a state of chronic inflammation, when introduced into the bladder of rabbits failed to induce cystitis, even when injected in considerable quantities. But when retention of urine was effected artificially for six to twelve hours, allowing time for ammoniacal fermentation to occur, cystitis was developed. The introduction of the ordinary pus cocci under such circumstances caused a suppurative inflammation of the mucous membrane of the bladder, and when non-pyogenic species were introduced a catarrhal cystitis is said to have been induced.

In thirty cases of cystitis studied by Rovsing the following results were obtained:

In one case diagnosticated as cystitis no bacteria were found; in three cases culture experiments gave a negative result, but the tubercle bacillus were found in the urine by microscopical examination—in these cases the urine was strongly acid; in twenty-six cases the urine was ammoniacal, and in all of these bacteria were found—usually but a single species. All of these grew in the usual culture media except the tubercle bacillus, which in two cases was associated with some other species, and all produced alkaline fermentation in sterile union when added to it in pure cultures. The following species were found: Tubercle bacillus, staphylococcus pyogenes aureus, staphylococcus pyogenes albus, staphylococcus pyogenes citreus, streptococcus pyogenes ureæ (n. sp.), diplococcus pyogenes ureæ (n. sp.), cocobacillus pyogenes ureæ (n. sp.), micrococcus pyogenes ureæ flavus (n. sp.), diplococcus ureæ trifoliatus (n. sp.), streptococcus ureæ rugosus (n. sp.), diplococcus ureæ (n. sp.), cocobacteria ureæ (n. sp.).

Rovsing records the important fact, as bearing upon the etiology of cystitis, that in twenty of the cases examined the bladder has been invaded by the finger or by instruments prior to the development of cystitis.

In twelve cases of cystitis, six of which were complicated with ascending nephritis, Krogius (1891) demonstrated the presence of *bacillus coli communis*, and showed that in its growth in culture media it corresponded with the *bacillus pyogenes* of previous authors. In a second communication Krogius states that in twenty-two cases of cystitis studied by him he obtained *bacillus coli communis* sixteen times, and of these fourteen times in pure culture. He also calls attention to the fact that in those cases where no other microörganism was associated with the colon bacillus the urine was always acid—a statement which is sustained by the subsequent researches of Schmidt and Aschoff. He also gives details with reference to the pleomorphism of this bacillus and the differences in the appearance of gelatin cultures from different sources, the growth being sometimes opaque and sometimes transparent. When cultures of this bacillus were injected into the bladder of rabbits and retained by ligating the urethra, an intense cystitis was developed in from twenty to thirty hours. Injections into the ureter gave a result similar to that subsequently reported by Schmidt and Aschoff. The animal died in about two days, and pyelitis, together with more or less necrosis of the renal epithelium, was found at the autopsy. Reblaub (1892) obtained *bacillus coli communis* in pure culture in six out of sixteen cases of cystitis examined.

Morelle (1892) and Denys (1892) in their bacteriological researches obtained from numerous cases of cystitis a bacillus which they identified with *bacillus lactis ærogenes* of Escherich. But the last-mentioned author has since stated that this bacillus presents varieties which cannot be distinguished from the typical cultures of *bacillus coli communis*.

The recent researches referred to having shown that *bacillus coli communis* is very commonly present in the urine

in cases of cystitis, and often in pure cultures, its etiological relation to the disease in question seems probable, and this view is further sustained by experiments upon animals and by the demonstrated fact that retention of urine *per se* does not give rise to inflammation of the bladder. But this is not the only microörganism which is capable of causing a cystitis when introduced into a bladder which has suffered some kind of mechanical injury, or has been subjected to the action of chemical irritants contained in the urine. The researches of Krogus, Schnitzler, and of Schmidt and Aschoff show that next to the colon bacillus the microörganisms most commonly found in cases of cystitis and of pyelonephritis is a proteus (*P. vulgaris*?).

At the date of the publication of the monograph of Schmidt and Aschoff the bacillus coli communis has been found in pure culture in sixty cases of cystitis, and the proteus in thirteen cases. The authors named say:

“ But two species of bacteria (bacillus coli communis and proteus) have, up to the present time, been demonstrated to be the cause of pyelonephritis. When, in addition to these, other bacteria or cocci are found, we have a pyæmic mixed infection.”

An important point to be kept in view is the fact that when bacillus coli communis is found in the urine in pure culture, this fluid is more or less acid, as the bacillus in question does not give rise to alkaline fermentation, at least not under the conditions found in the bladder and in the absence of retention. But when proteus is present the urine is almost always ammoniacal.

The number of cases of pyelonephritis reported since 1889 by the authors heretofore referred to (Albarran, Rodet, Morelle, Krogus, Achard and Renault, Schnitzler), in which bacillus coli communis was found and was probably the exciting cause of the ascending nephritis, is twenty-nine, and in twenty of these the bacillus referred to was found in pure culture.

The most important and comprehensive work upon the bacteriology of pyelonephritis is that of Schmidt and Aschoff, published in Jena in 1893. The authors named give a complete *résumé* of the literature of the subject, and a full report of fourteen cases of pyelonephritis, in which they have made bacteriological investigations. They also report a series of experiments upon rabbits, in which injections of a pure culture of the bacillus coli communis were made into the left ureter, after tying it below the point of injection. The ligature was removed after the injection had been made, and the wound in the abdominal wall, which had been made with antiseptic precautions, was closed. Some of the animals so treated died in from twelve hours to four or five days, while others survived and were killed on the seventh and ninth day.

The left kidney, especially in the cases which survived the operation for several days, was found to be two or three times as large as the right and to present all the evidences of parenchymatous inflammation. The pelvis of the kidney contained more or less ammoniacal urine, pus and bacilli; the parenchyma gave evidence of diffuse inflammation and contained numerous bacilli. As a rule a pure culture of the bacillus coli communis was obtained from the inflamed kidney.

A similar experiment was made with a species of proteus (*vulgaris*?), and with a similar result. The animal died at the end of two days. The left kidney was twice as large as the right, the surface of a deep-red color dotted with numerous white spots; the parenchyma had a striped appearance on section and a greenish color in the vicinity of the pelvis, which contained ammoniacal and bloody urine. A putrefactive odor was given off from the organ. Proteus in pure culture was recovered from the interior of the kidney.

Another rabbit received in the same way an injection into the ureter of a bouillon culture of staphylococcus pyogenes aureus. The animal died at the end of forty-eight hours. A fibrinous inflammation was found at the point of injection

and the left kidney was about twice as large as the right. The capsule was easily detached and the surface was of a deep-red color dotted with small white foci of infection, which also existed throughout the organ. The pelvis contained thick reddish-colored pus. *Staphylococcus aureus* was recovered in cultures from the kidney and from blood taken from the heart.

Schmidt and Aschoff say that the changes found in the kidneys of rabbits after the injection of the *bacillus coli communis* into the ligated ureter correspond with those seen in the "surgical kidney" of man. They were surprised at the rapidity with which the bacilli penetrated the urinary tubules. The first changes in the parenchyma of the organ occurred at the end of thirty-six hours, and at the end of five to seven days these changes had reached their extreme development. They evidently depended upon the invasion of the urinary tubules of bacilli.*

The experiments of Wreden (1893) show that in rabbits, when the mucous membrane of the rectum has been injured in the vicinity of the base of the bladder, the microorganisms of the intestines may penetrate to the bladder and give rise to a cystitis. Possibly this may occasionally be the channel by which vesical infection occurs in man. This is the view of Follin and Duplay, who believe that inflammation of the bladder may result in this way when there is a lesion of the rectal mucous membrane due to the presence of a neoplasm or to inflammation of an acute or chronic character.

Schnitzler, whose results are above referred to, obtained a liquefying bacillus (probably *proteus vulgaris*) in a considerable number of cases of cystitis in females suffering from ulcerated carcinoma of the uterus. *Proteus vulgaris*, which is a widely distributed putrefactive bacillus, is commonly found in the discharges from ulcerated or necrotic tissues, and its introduction into the bladder in the cases referred to is believed by Schnitzler to have been chiefly due to catheterization with an instrument soiled by these discharges.

* Quoted from a paper by the present writer read before the Congress of American Physicians and Surgeons, Washington, May 31, 1894.

As to the pathology of suppurative pyelonephritis following cystitis: The kidneys are found to be swollen and hyperæmic, and to contain numerous purulent foci, some of which are so small as not to be recognized without the aid of the microscope. Larger collections of pus constitute abscesses of considerable size or may be recognized as white streaks running in the direction of the tubes and having congested margins. The pelves of the kidneys give evidence of inflammation and contain more or less pus. The ureters, also, are apt to be inflamed, and the thickened walls smeared with pus or with a fibrinous exudation, while the bladder presents the appearance characteristic of chronic cystitis.

The Pathology, Etiology and Symptomatology of Tabes Dorsalis, with its Differentiation from Ataxic Paraplegia and Spinal Spastic Paralysis.*

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Pathologically considered, Tabes is an affection of the entire cerebro-spinal axis in addition to the peripheral sensory nerves. The cerebral cortical region, the peripheral nerves and many cranial nerve nuclei participate in the degeneration. The cord in general is firm, flattened and in a wasted or atrophic condition. This atrophy is most noticeable in the region of the posterior columns, which columns on transverse section are of a yellowish, gray appearance; the pia is usually thickened and closely adherent to the adjoining arachnoid and dura, and there is a general connective tissue increase throughout the cord, being most abundant in the posterior columns, the posterior root zones, the column of Lissauer and about the entrance of the posterior nerve roots. The spinal fluid is somewhat increased.

* Read at the annual meeting of the Rensselaer County Medical Society, May 14, 1895.

An accurate knowledge of the minute anatomy of this disease can only be secured by making a study of a series of sections at various levels, properly hardened and stained, the best method of staining being with carmine and Weigert's haemotoxylin. The degeneration doubtless begins with the true nerve elements, not only of the sensory part of the spinal cord but in the sensory peripheral nerves as well. The sclerosis which afterwards follows and gives to the disease its chief macroscopic, as well as microscopic appearance, is doubtless secondary in nature, although some eminent authorities regard the sclerosis as the primary cause and the neural degeneration as secondary. These base their claims upon the well known fact that in some cases the inter-funicular artery has been found thickened and the connective tissue apparently had its starting point from the tunica adventitia of that vessel.

As the affection is most advanced in the legs and lower part of the trunk, the highest degree of sclerosis will be found throughout the lumbar and lower dorsal segments. In cases where the arms are affected, however, the cervical cord is involved but usually in a less marked degree. The degeneration begins at first to affect the elements in the posterior and middle root zones, or that part of the postero-external column adjacent to the inner surface of the posterior horns, thus involving all the nerve elements which pass through that region. It may involve the whole of the columns of Burdach and Goll, but this is the exception, save in cases of great severity. Above the point of greatest disease one finds an ascending degeneration involving the postero-external columns which continues upward until the columns end in their respective nuclei, but the column of Burdach is not usually affected above that point. In addition to the above areas, Lissauer's column is early affected. Frequently, the posterior commissure, the cells in Clark's vesicular column, Gowers' antero-lateral ascending tract and the direct cerebellar tract are all implicated. The posterior nerve roots are doubtless early involved, as they show marked

degenerative changes, are frequently atrophic or largely replaced by connective tissue.

Under a moderately high power objective one finds distinct evidence of destruction of many nerve fibres, implicating early the axis cylinders and breaking their protoplasm into minute granules, which are afterwards replaced by connective tissues, leaving withered and destroyed nerve tubes. There is an early implication of the myeline or medullary sheath of Schwann, which is likewise broken up into numberless granules, and true amyloid bodies are seen scattered among the nerve elements. In early cases delicate connective tissue bands can be seen twining about between the nerve tubes; later the sclerosis so predominates that one finds but few nerve tubes remaining, giving the affected part the appearance of a colloid mass.

Changes of a like nature have been found in the sensory peripheral nerves of the extremities, as well as in some of the cranial nerves, particularly those of special sense, as the optic, auditory, glosso-pharyngeal. Oftentimes the motor oculi and pneumogastric are involved.

The disease late in its course manifests a decided tendency to affect other parts of the cord, especially the ganglionic cells existing in the anterior horns, thus causing an atrophic paralysis with changes in the anterior nerve roots, as well as in the muscles which are enervated by them. The lateral columns are also usually implicated late in the affection.

ETIOLOGY.

The disease is found more frequently in middle life and more commonly in men than in women. The latter discrepancy may in part be explained by the greater exposure, pernicious habits, excessive venery and the frequency of syphilis in men. Excessive venery and great fatigue, resulting from too great mental or manual labor, are ascribed by some as having distinct etiological relations. It may follow traumatism and meningitis from extension of inflammation to the posterior nerve roots.

Syphilis bears a very close etiological relation to Tabes. In the majority of cases one can find pathologically no distinct evidence of a syphilitic lesion in the posterior columns or in any other part of the cerebro-spinal axis; but it cannot be denied that syphilis must have some unknown influence upon the growth, nutrition or the production of a proper condition for the slow degeneration of the nerve elements. In most cases there has been no evidence of secondary manifestations. The disease may show itself anywhere from five to twenty years after the initial lesion. Fournier says, "Syphilis is the exciting cause in most cases. Of 146 cases analyzed by me, 9 were without syphilitic lesions; 22 were doubtful, i. e., had suffered from venereal sores, but whether syphilitic or not could not be ascertained; 112 cases had undoubted syphilis, and 3 had evidences of hereditary syphilis." Erb found that in 300 cases of Tabes in private practice, 89 per cent had had syphilis. Among 14 cases, which I happened to see at Prof. Mendell's clinic, 13 had had syphilis, manifested by hard chancre, and each had been treated with mercury.

SYMPTOMATOLOGY.

For convenience, we may group the symptoms of Locomotor Ataxia into three stages; first, the pre-ataxic stage; second, the ataxic stage, and third, the paralytic stage. The symptoms that precede the ataxic stage are absolutely pathognomonic. The three diagnostic symptoms, which, with rare exception, are always present at an early date, are, in the regular order of their occurrence, loss of the patella tendon reflex, stabbing, lightning-like or vagabond pains and the Argyll-Robertson pupil. The loss of tendon reflexes occurs oftentimes for a long period before other characteristic symptoms are made manifest. When the patella reflex is found absent, after careful re-enforcement, this loss should be looked upon as pathological, and the patient should be carefully examined as to other early symptoms, as the patella reflex is rarely absent in health. I can recall but one instance

in many examinations where I found this departure in health. The most probable cause of its absence in Tabes is that of an interruption of the reflex arc due to a cutting off by the disease of the sensory nerve, carrying the afferent impulse through the posterior horns or root zones. Gowers believes it to be due to an interruption (neuritis) of the sensory muscle nerve in the quadriceps extensor. It seems to me highly improbable that at the early date, at which this loss may be found, that a peripheral neuritis so localized should exist, although one can readily see how easily its absence could be explained on such a supposition.

The pains are often among the earliest symptoms. These differ very much, but the characteristic ones are the neuralgic, which come and go quickly, are of great violence, of a stabbing, knife-like character, often making the patient cry out.

After the pains disappear the parts affected are extremely hyperæsthetic. Dull, rheumatoid pains occur with changes of the weather, so that the individual learns to dread all sudden changes. The pains of the disease continue well on into the second and third stages, and will be again referred to in this paper. They are doubtless due to the degenerative changes going on in the nerve fibres, either peripheral or in the spinal cord, or both.

The Argyll-Robertson pupil has, in its typical form, three symptoms; viz., loss of light reflex, retention of accommodative movements, though they may be sluggish, and myosis, as minute, perhaps, as the pin-point pupils of opium narcosis.

The loss of the light reflex might be explained by the degeneration of the conducting afferent path, the optic, or by the conducting efferent path, the motor oculi; or by a lesion in the third nerve nucleus, or in the association tracts connecting the anterior corpora quadrigemina with the nuclei of the third nerves. Destruction of these latter fibres will arrest the light reflex, and the loss of reaction will not be accompanied by blindness or paralysis in the domain of the third nerve proper. It seems probable that this latter loca-

tion is the most likely site for the lesion and best explains the loss of light reflex. Optic atrophy and third nerve paralysis rarely, if ever, occur before the loss of light reflex, the latter usually antedating them by a long period.

In addition to the above ocular symptoms, a gradually increasing gray atrophy of the optic nerves may occur, producing at first a decrease of the visual fields and finally passing on to a condition of complete blindness. Slight ptosis, often associated with external strabismus, giving double vision, is present. In some of the preataxic cases, in which optic atrophy is an early symptom, the atrophy progresses to almost total blindness, and then the disease apparently comes to a standstill, the pains become less agonizing and frequent, ataxia rarely supervenes, crises do not occur, and the patient is to all appearances well, apart from the sad condition of almost total blindness. A case of this character is now under my observation.

The Second Stage. Ataxia, inco-ordination, or the loss of the muscular sense, is common to several diseases affecting the central nervous system; in this disease it is probably observed in its most characteristic form. It comes on rather gradually and is at first observed on getting out of bed or on washing the face with the eyes closed. The individual soon notices that it is with great difficulty that he walks in the dark, and when the ataxia is well marked he is absolutely obliged to remain home at night because of the inability in the dark to use his eyes as a guide and to maintain his equilibrium. On turning quickly he is likely to fall, and when asked to walk backward sways from side to side, and in typical cases would often fall if not watched with care. When requested to stand with toes and heels together and with eyes closed, he sways from side to side, his movements become coarse and irregular and he falls unless he opens his eyes. (Romberg.)

The gait soon becomes characteristic; the individual walks with his legs wide apart, they are thrown out violently and irregularly, usually with a stamp, the heel strikes the ground

first or the whole sole may be planted flat. He walks with two sticks and guides his movements by ocular impressions, bending his head forward and constantly watching the ground; this gait is absolutely characteristic of Tabes. The inco-ordination may be brought out when the patient is recumbent by asking him to place the heel of one foot on the opposite knee.

If the ataxia exists in the arms it is usually noticed by the patient in many fine movements, as lacing his shoes, buttoning his clothes, in the act of writing, etc. It may be brought out by having the patient bring the points of both index fingers end to end, when the arms are swung together from a distance, or by having him touch the end of his nose quickly with the tip of his index finger.

With this great loss of muscular sense producing marked ataxia or inco-ordination, it is quite remarkable that there is no apparent loss of muscular strength; the grip of the hands may be as powerful as ever, and the legs, as evidenced by trying to overcome movements of flexion and extension, perfectly normal. Lightning pains may exist throughout this stage and numbness, tingling, formication, areas of anæsthesia on the soles, about the ankles and extending upon the legs, may occur. The patient often feels as if he were walking upon cotton or on a velvet carpet. There may be marked delay or retardation to the conduction of painful impressions, they being perceived from five to ten seconds later than normal and thermal impressions may be similarly delayed. Another interesting condition is an abnormal reference to the site of production of painful impressions, they being referred to the opposite limit or distant parts of the same limb.

The exact mechanism concerned in the production of inco-ordination in Tabes has caused much discussion and is by no means at present a settled fact. That it is primarily due to loss of cutaneous sensibility seems improbable, because marked ataxia may exist without the slightest anæsthesia, and per contra, great anæsthesia may exist without any, or with but slight ataxia. The most probable explanation is

that of destruction of the peripheral sensory muscle nerves or of their conducting paths in the cord, the postero-internal columns or possibly both media may be affected.

It must be remembered that the postero median columns do not decussate in the cord, and that they communicate with the cerebellum by means of the arcuate fibres through the restiform bodies; this being true, disease of the peripheral sensory muscle nerves or of their conducting paths in the cord, may interfere largely with the controlling influence normally exerted by the cerebellum over muscular movements in maintaining equilibrium.

The retardation to conduction of painful and thermal impressions is probably due to partial degenerative changes in the peripheral nerves. The retention, until the second stage, of perfect muscular power is due to the strict localization of the lesion to the sensory peripheral nerves and sensory part of the cord.

The bladder sphincter is frequently affected, and there may be at first a retardation or hesitancy in urinating, later there may be paralytic retention, leading usually to destructive cystitis. Constipation is the rule. The patient in most cases has perfect control over the rectal sphincter. Sexual power may be early impaired or retained until the third stage, when it is weakened or lost.

Certain attacks of atrocious pain may occur in this disease, which attacks are called crises. The more common forms are gastric, laryngeal, of neck of bladder, rectal, of clitoris, nephritic and cardiac. The forms most often observed are the gastric and laryngeal. The former usually comes on with intense pain, followed by violent nausea and vomiting. The laryngeal form is usually attended by spasm of the glottis, croupy respiration and sense of impending suffocation. The cause of the visceral crises is not known, but changes have been found in the neighborhood of the sensory nucleus of the pneumogastric nerve. Of the atrophic symptoms, perforating ulcer and Charcot's joint disease are the most common forms, both conditions being now ascribed to a

peripheral neuritis. After the attacks of pain it is no uncommon thing to observe herpetic eruptions.

The Third Stage. This is due to an extension of the disease to the anterior horns or lateral columns. If the former are affected, there is added an atrophic paralysis, with reaction of degeneration; if the latter are involved, a paralysis with increased muscular irritability follows. These conditions last until the unfortunate patient is removed by sepsis, resulting from his cystitis and pyelo-nephritis or by bedsores or some intercurrent malady.

I have gone somewhat at length into the symptomatology of this disease in order to present a perfect clinical picture, and to impress you with the great value of certain pathognomonic symptoms, from which a diagnosis can be absolutely made. The two diseases which are so frequently confounded with Locomotor Ataxia are Ataxia Paraplegia and Primary Spastic Paralysis. In order to make clear their differentiation, three patients from my private practice each presenting a typical illustration of one of these diseases, kindly consented to come before you to-day. The first gentleman is suffering from the disease described by Gowers as Ataxia Paraplegia, or combined posterior and lateral sclerosis. As its name implies, you have ataxia or incoordination plus stiffness, weakness or paresis. It will be needless to give you a detailed account of the symptom complex of this affection more than to call your attention to its manner of onset and its leading clinical symptoms. The onset is gradual, several years elapsing before walking is much interfered with. The legs suffer most, as the affection is usually limited to the lower extremities, the arms being rarely affected. Pains are very infrequent, and when they do occur they are of a dull, rheumatoid nature commonly located in the lumbar region. A girdle pain is the exception. Sexual power is often early impaired, and the sphincters are usually involved. Symptoms in the domain of the cranial nerves are rare. The Argyll-Robertson pupil is almost unknown and optic nerve atrophy very

rare. Numbness, referred to the feet, is rather common, but sensation is in most cases perfectly retained. Later on the patient develops a characteristic gait made up of spastic paraplegia plus inco-ordination, and characterized by marked weakness with rigidity and by the patient swaying in an irregular manner. The feet do not come down with a stamp, nor does the heel strike first as in Tabes. There is often marked trepidation, the toes stick to the ground, and although the knees do not interlock, there is a tendency in that direction. Myotatic irritability is greatly increased, the patella tendon reflexes being exaggerated and marked, ankle clonus being usually obtainable. Rectus clonus also is frequently present. The ataxia is often as well marked as in typical cases of Tabes and Romberg's symptom is always present; visceral crises are unknown. To sum up, we have weakness and stiffness in the legs, a gait which is a combination of muscular weakness and inco-ordination, great muscular irritability, absence of lightning pains, no visceral crises, no pupillary phenomena, and no implication of cranial nerves. The only symptom common in this affection with that of Tabes is the ataxia, this in both being almost identical. In the combined sclerosis we have exaggerated tendon reflexes but we miss the lightning pains, the visceral crises and the Argyll-Robertson pupils, all of which are so eminently characteristic of Tabes.

From spastic spinal paralysis or primary lateral sclerosis, Locomotor Ataxia can be easily differentiated. The mode of walking in the two affections differs so decidedly that the mere tyro should be able at a glance to distinguish between them. In spinal spastic paralysis, weakness, stiffness and myotatic irritability come on gradually and soon the characteristic gait manifests itself. The patient walks slowly and rigidly, usually assisting himself by two canes, the feet appear glued to the floor or ground, are moved forward with difficulty creating an unpleasant, scraping noise; the toes drag along the ground, the foot which is brought forward tending to cross in front of its fellow. This is the "cross-

legged progression"; the knees frequently interlock and the patient leans forcibly on one stick and then on the other. The ball of the foot or the toes always strike the ground and at the time of contact a clonus is frequently created which produces a peculiar hopping movement of the whole body; this is the "trepidation" described by Erb.

The deep reflexes are always greatly exaggerated, the knee jerk being very active, the ankle clonus and often the rectus clonus readily obtained. Nothing characteristic can be said of the superficial reflexes, they may be normal or exaggerated. Sensory symptoms do not exist, and the disease manifests no tendency to affect the cranial nerves. The muscles are usually well nourished, in fact, they appear in some instances enlarged. The bladder is usually affected, there being hasty micturation, the individual often wetting himself. This is due to a hasty reflex contraction of the detrusor muscle, the result in part of a loss of inhibitory control.

In contrasting the differential signs of the two affections, we have in Tabes an entirely dissimilar gait, absence of patella reflexes, presence of Argyll-Robertson pupil, sensory disturbances, lightning pains, inco-ordination and cranial nerve implication. In spastic spinal paralysis there exist increased patella reflexes, ankle and rectus clonus, a characteristic gait which differs essentially from that of Tabes, made up of weakness, rigidity and trepidation, and there are no evidences of inco-ordination, pupillary phenomena, cranial nerve involvement or sensory disturbances.

To Remove a Fish-bone from the Throat.—Give about 4 or 6 ounces (125 to 185 grammes) of milk to drink. In forty minutes give an emetic dose of sulphate of zinc. The milk goes down in the fluid state and easily passes the obstruction: by a short stay in the stomach it becomes coagulated into a more or less solid mass, and coming up forces the bone before it.—Frank Van Allen, Madura, India, in *Medical World*.

Report of One Hundred and Forty-Five Operations Done for the Removal of Ovarian Tumors and Pathological Conditions Associated with the Ovaries and Uterine Appendages Only.

BY A. VANDER VEER, M. D.,

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CONTINUED FROM PAGE 252.

An abstract of this paper was read at the meeting of the American Association of Obstetricians and Gynecologists, Toronto, Canada, September 19th, 1894.

CASE CXVII.—Mrs. R. C., family history of dropsy, phthisis and paralysis. Patient always healthy. Menstruated at fourteen; regular until '88. Married twenty-five years; six children, youngest sixteen years of age; no miscarriages. First noticed abdominal enlargement September 1, '93; not attended with pain until four or five weeks previous to operation. Cœliotomy, before class, November 2, '93. Twelve quarts yellowish fluid removed from abdominal cavity, which was found studded with tubercles; glass drainage; good recovery; discharged nineteenth day.

CASE CXVIII.—Mrs. E. McC., no history of cancer or tuberculosis. Patient healthy, with exception of having what she says was progressive muscular atrophy when seventeen. Menstruated fourteen. Married at fourteen; never had any children, but miscarriage when fifteen; always regular. In February, '92, first noticed feeling weight and oppression in left side and in back; sewed a good deal with sewing machine, always worse afterwards; April, '92, fell off stoop, struck on left side and felt worse since; February, '92, began to flow every two or three weeks; since April, '93, has been regular; August, '92, confined to bed for a time, and occasionally since. Cœliotomy November 16, '93. Both ovaries adherent; left one especially, removed first; right cystic, also removed; firm adhesions; glass drainage introduced; drainage removed after twenty-four hours; recovery; discharged December 30, '93.

CASE CXIX.—Miss K., diagnosis old general and pelvic peritonitis—dysmenorrhœa—hystero-epilepsy. Diagnosis confirmed at operation, November 29, '93, private house. Left ovary and tube could not be found; removal ovary and tube right side, like small intestine; many and very firm adhesions; recovery. Very much better for six months after operation; since then occasional convulsions, not so severe, however; has had an occasional flow.

CASE CXX.—Mrs. H. W., family history good. Eight children; one miscarriage, July, '92. Patient always healthy, with exception serious illness at thirteen; menstruated at that time, always regular; since miscarriage, pain in left side abdomen; May, '93, had inflammation kidneys; œdema ankles at times. Cœliotomy November 30, '93. Left ovary cystic, removed first; right cirrhotic, also removed; no drainage; good recovery; discharged twenty-second day. Excellent health eight months later.

CASE CXXI.—Miss E. L. H., family history good. Patient always delicate. Menstruated fifteen; regular. '90 noticed enlargement abdomen, thinks first apparent right side; enlarged slowly but steadily since—no pain—sore when she walked far and feeling of being tired. Cœliotomy December 7, '93. Large ovarian cyst attached left ovary, contained twenty pints fluid—cyst when removed weighed fifteen ounces; right ovary atrophied, also removed; no drainage; good recovery. Discharged January 23, '94.

CASE CXXII.—Miss S., invalid for past three years, unable to get about her household duties; confined to room a good share of time. Menstruation at times very painful quite free, much leucorrhœal trouble and bladder irritation. Diagnosis double pyosalpinx. Cœliotomy December 7, '93. Tubes very much thickened, full of pus, ovarian abscess on left side (right side tube double), ovary adherent to small fibroid situated in posterior wall uterus. Latter not disturbed. Uterine appendages removed, patient making excellent recovery; discharged from private hospital on fifteenth day after operation.

CASE CXXIII.—Miss E. M., family history good. Patient in fairly good health, though suffering much from pelvic pains at different times. Two months previous to operation suffered severe pelvic peritonitis, with undoubted salpingitis. Diagnosis double pyosalpinx, with adhesions. Patient emaciated and weakened. Cœliotomy December 15, '93, eleven A. M. Left ovary very adherent to surrounding structures, liberated with great difficulty. Trendelenberg position—considerable hemorrhage. Right ovary very adherent. Appendages thoroughly removed. Bleeding points controlled with one exception down at right side, where it seemed impossible to place ligature. Long artery forceps placed and left in position. Cavity abdomen thoroughly flushed with saline solution. Glass drainage; tampons iodoform gauze inserted around tube and forceps. Operation eighty minutes. Took anæsthetic nicely, but none for last half hour. Did not rally, dying from shock 10:50 P. M. day of operation. Impossible to have lessened this operation in any way. It was either to have abandoned it in beginning or to go on and complete, and the result proved it too much for her strength.

CASE CXXIV.—Mrs. M. S., aet seventy-one. Family history tuberculosis, paralysis and cancer. Menstruation not painful but irregular; passed menopause safely at fifty-one. January, '93, had severe attack of grippe. November, '93, first noticed abdominal enlargement and pain, particularly left side. Increased somewhat rapidly. Oedema of lower extremities during summer, '93. Tapped four times by family physician, Dr. A. W. Van Slyke, and once, in consultation, with myself about December 1, '93. Diagnosis multilocular ovarian cyst, and operation advised, although patient emaciated and weak. Cœliotomy December 18, '93. Large multilocular cyst, right ovary. Thirty-two pints fluid removed. Obligated to break down one cyst within another before removal of sac. Adhesions not numerous. Weight of cyst trifle over three pounds. Glass drainage. Patient did not rally from operation and died suddenly 4:15 A. M., December 19, '93, from symptoms of pulmonary infarction. This case would have stood a very much better chance for recovery had the operation been done immediately after first tapping.

CASE CXXV.—Mrs. P. S., family history phthisis. Patient well as a girl. Menstruated thirteen—never regular—often twice month. 1891 suffered from

pain right side abdomen. Attacks lasted half hour. Physician diagnosed biliary colic. March, '93, after attack, noticed enlargement abdomen. Never painful. No history of being jaundiced. Operation December 21, '93. Small ovarian cyst right ovary; tapped and removed. Few adhesions. Left ovary cystic and removed. Small cyst left ovary ruptured, when attempting removal ovary. No drainage. Rallied nicely—some nausea. Bowels moved second day. Recovery uneventful. Discharged January 4, '94.

CASE CXXVI.—Miss H. V., aet nineteen, family history good. First noticed enlargement left side abdomen, August, '93, accompanied with much pain. Tumor increased rapidly. Cœliotomy January 2, '94. Large multilocular cyst left ovary, containing eleven quarts fluid, thick, viscid, dark-colored. Firm adhesions, from left side abdomen, with some coils small intestines. Right ovary in condition cystic enlargement, removed with tube. Glass drainage; removed second day. Recovery very rapid. Patient very homesick and allowed to return on tenth day. Returned to hospital May 15, '94, with marked growth left side of pelvis, probably nature sarcoma. Patient very much emaciated. No further operation advised.

CASE CXXVII.—Mrs. E. F. S., family history good. Mother two children. After birth second child, '86, patient had severe pain lower part abdomen—greatly increased when nursing child. Ulceration uterus treated daily, but never cured. Irregular flow; bearing-down pains; could not walk; lacerated cervix repaired February 10, '93—improved. This operation followed six weeks later by pelvic abscess which discharged through rectum. Pain in right ovary continued. Cœliotomy February 22, '94. Removal uterine appendages; many firm adhesions. Glass drainage. Uneventful recovery; discharged twenty-sixth day.

CASE CXXVIII.—Miss J. D., had given many symptoms of pelvic disturbance, but no special organic change to be observed. Had been vomiting more or less for six months, quite continuously for past three months. No line of treatment apparently any good. Finally, at the earnest solicitation of herself and friends, it was decided to do a cœliotomy, believing there was some diseased condition of the tubes and ovaries impossible to make out. Operation February 23, '94. Uterus not fully developed, yet tubes and ovaries presented a normal healthy condition. There were some few adhesions giving evidence of past pelvic peritonitis. These adhesions loosened up, tubes straightened, but appendages not removed. The case went on to complete recovery. Stomach behaved very much better after the operation, patient able to retain more nourishment. Morphine given for short time after operation. Slow but excellent recovery.

CASE CXXIX.—Miss A. E., pelvic peritonitis—dysmenorrhœa. Cœliotomy February 24, '94. Removal uterine appendages. Many firm adhesions. Excellent recovery.

CASE CXXX.—Miss M. D., family history very good. Never sick with exception two attacks diphtheria, last occurring '89, and dates all trouble from this. Menstruated sixteen, never regular, painful. Latter part '92, noticed pain right hypogastric region associated with enlargement in that locality. Pain increased, but tumor decreased. Cœliotomy February 27, '94.

Double ovariectomy. Right ovary cystic, removed, cyst wall breaking down and fluid not measured. Left ovary in like condition. No drainage. Recovery uneventful. Discharged thirtieth day.

CASE CXXXI.—Mrs. W. J. O., diagnosis doubtful as to nature tumor. No children; three miscarriages. Cœliotomy March 1, '94. Removal ovarian cyst left side. Enlarged ovary right side with pyosalpinx. Many adhesions. Recovery.

CASE CXXXII.—Miss S. N., family history negative. Patient well until six months prior to operation, when languid, not inclined to work, and excitable. Menstruated fourteen; regular, scanty and painful. Sharp pain lower part abdomen. Cœliotomy March 19, '94. Left ovary cystic, tube much enlarged and corrugated—removed first. Right ovary showed similar condition and removed. Many adhesions. Wound closed without drainage. Recovery uneventful—discharged nineteenth day.

CASE CXXXIII.—Mrs. L. D., married, one child. For past two years has suffered greatly from repeated attacks of pelvic peritonitis. An operation finally advised by her family physician, and in which I fully concurred. Cœliotomy March 23, '94. Many adhesions, tubes thickened; excellent specimens pus tubes. Uterine appendages thoroughly removed. One hypodermic morphine given after operation. Patient developed on third day an attack of bronchitis, temperature 101, pulse 100, respiration 22, but from this she made a good recovery. Wound did nicely, and she made excellent recovery.

CASE CXXXIV.—Miss J. McC., family history good. Menstruated fourteen; irregular first few years, then regular but scanty and painful. Patient complained pains in back in lumbar region, persistent headache, more severe during menstrual periods. Never noticed enlargement abdomen. Scarlet fever in childhood, followed by inflammatory rheumatism. Diagnosis pyosalpinx. Cœliotomy March 30, '94. Ovaries and tubes low down in pelvis and hard to reach. Diagnosis confirmed; uterine appendages removed. Iodoform dressing used. Many adhesions. Patient made uneventful recovery—discharged twenty-fifth day.

CASE CXXXV.—Mrs. H. A. L., aet forty-three, widow, no children. During married life constantly under treatment for uterine troubles, wearing all manner pessaries, confined to bed frequently for a year at a time, had severe leucorrhœal trouble, at times dysmenorrhœal trouble. I saw her five years previous to operation with family physician, found her suffering severely from retroversion, enlarged tubes and every evidence of pyosalpinx. Advised an operation, but patient would not consent. During five years following, under variety of treatment, most of time making use of tampons herself; would recover for a month or so, but most of time confined to bed; great irritation of bladder frequently; constipated, very careless in every respect in care of person, had little love for medical profession, and no kind word for any one. February, 1894, consented to an operation, it requiring nearly a week's work on part of nurse to get surface of patient's body and vagina in any kind of aseptic condition. She was absolutely rebellious to taking of a bath, and proper evacuation of bowels. Made an effort to quarrel with nurse morning of operation because an additional scrubbing was insisted upon.

Cœliotomy in my private sanitarium March 30, '94. Diagnosis confirmed. Operation difficult, though adhesions gave rise to little hemorrhage. Patient recovered from ether quickly, but rebellious in every respect as to carrying out line of treatment. Insisted upon sitting up in bed; objected to use of bed-pan. Little vomiting, little tenderness over abdomen, but difficult to keep dressings on she was so restless. Bowels moved second day thoroughly well. At this time noticed abscess developing in left labia, opened and discharged pus very freely. Stich-hole abscess lower end incision. Began to vomit at this time, which continued more or less. She wore out strength and patience of two nurses, and at last hypodermic injection of morphia necessary, learning then she had been using it for a long time. Wound in every respect, aside from stitch-hole abscess, presented a healthy appearance, healing quickly, but patient died, evidently of septic peritonitis, April 5, '94. No autopsy. I think I voice the sentiment of every operator when expressing the desire to be delivered from such a patient.

CASE CXXXVI.—Miss J. K., family history consumption and diabetes. Menstruated fourteen; regular exception first few periods, then having seizures resembling epilepsy. Flow normal in amount. Diagnosis hysterio-epilepsy. Cœliotomy April 6, '94. Removal uterine appendages—not difficult. Recovery; discharged twenty-fourth day. Had one convulsion six months after operation.

CASE CXXXVII.—Mrs. M. S., family history consumption paternal side; good otherwise; menstruated fourteen, regular; dysmenorrhœa. No children; no miscarriages. Typhoid fever '86, two years later pain in ovaries and back. Bloating extremities and abdomen disappearing after time. Fell from hammock beginning menstruation, injuring back; later strained herself leaning over manger, followed by tumor in abdomen, not perceptible exteriorly, but noticed moving around. Cœliotomy April 17, '94. Ovaries found undergoing cystic degeneration; tubes corrugated and extended. Removal uterine appendages. Many adhesions. Good recovery. Bowels moved third day. Discharged May 23, '94.

CASE CXXXVIII.—Miss L. S., never strong; family history, several members died phthisis. During fall '93 patient suffered a prolonged, serious attack of pelvic peritonitis, giving evidence at times of trouble with appendix—probably tubercular peritonitis. From this attack she made a fairly good recovery and improved somewhat during the winter, although at times there presented occasional symptoms of appendicitis. Cœliotomy April 28, '94. Ovaries much enlarged, much thickened, pelvic peritonitis, perineum studded and giving evidence of old tubercular trouble. Appendix had many adhesions, as well as being thickened. This, together with the uterine appendages, was removed. Patient made good recovery, and discharged May 20, '94, from private hospital.

CASE CXXXIX.—Mrs. F. F., well as girl. No menstrual trouble. Married at eighteen; two children; '86 began to have pains in back; menstruation irregular since. Diagnosis cystic ovaries. Cœliotomy April 30, '94. Diagnosis confirmed. Removal appendages. Few adhesions. Wound closed silk worm gut sutures. Good recovery. Discharged twenty-second day.

CASE CXL.—Mrs. E. V., family history; father died Bright's disease, mother cerebral hemorrhage, otherwise good. Patient menstruated seventeen; married nineteen; first pregnancy normal; at second run over with wagon twice. Three children; two miscarriages, last October 10, '93, dating illness from this. Severe pain all time, both sides uterus, aggravated during micturition. No movement without use cathartics. Never noticed tumor in abdomen. Diagnosis fibroid uterus; dysmenorrhœa. Cœliotomy May 12, '94. Removal appendages. Recovery. Discharged twenty-second day.

CASE CXLI.—Miss E. M. K., diagnosis ovarian cyst confirmed at operation May 20, '94. Removal double ovarian dermoid cysts. Few adhesions. Drainage. Recovery. Well June 16, '94.

CASE CXLII.—Mrs. L. D., family history consumption, tumor and kidney trouble. Patient menstruated fourteen—regular, painful and profuse; two children; no miscarriages; '89 troubled with faintness, pains in abdomen, inguinal region and back. Severe headaches, dizziness, catarrh bladder. Diagnosis cystic degeneration both ovaries. Chronic peritonitis. Operation May 29, '94. Diagnosis confirmed. Removal uterine appendages. No drainage; good recovery; discharged twenty-sixth day.

CASE CXLIII.—Mrs. A. G. W., married, one child. Five years previous to '88 she had given history some pelvic lesion, being confined to bed almost continuously. At this time much emaciated, waxy, pale looking. On examination then by Dr. Church there was found complete retroflexion with pelvic cellulitis, position of uterus and all giving very distressing condition of constipation and pain in securing movement of bowels. She had taken a great quantity of medicine, powerful laxatives having very little effect. There was much distress on pressure over the vertebræ in dorsal and lumbar region, sensitive throughout whole extent of spine with some lateral curvature. In the doctor's attempt to restore the uterus to its normal condition she suffered a sharp, acute attack of pelvic peritonitis. This was followed by a bloody discharge from the rectum giving indications of chronic dysentery, Spinal trouble treated successfully by application of plaster of Paris jacket. After uterus had been restored to its more normal position, the doctor dilated the cervical canal for relief of the stenosis which was followed by her only pregnancy. After fully recovering she was attacked with grippe, which was followed by another long siege of dysentery, with evidence of some trouble about the left hip, thought at one time to be a case of hip disease. Finally all symptoms external to the pelvis improved and she could walk about quite well, when taken with severe cystitis which continued in a very tedious manner for some time, accompanied with paroxysms of pain of a most excruciating and lancinating character, in right iliac region, resulting in a discharge from vagina of an exceedingly copious disagreeable-smelling pus. Her general health was now very feeble, complete loss of appetite, free perspiration. At same time a swelling could be observed in right lumbar region, also below Poupart's ligament, and at one time there was quite definite prominence in Scarpa's triangle, making one feel quite positive that it was a case of psoas abscess. All of these conditions subsided immediately after free discharge from pelvis. When the case came under my observation in the beginning of

winter of '94, I felt it was one of true double pyosalpinx and advised an operation. This was done May 30, '94. Many adhesions present; diagnosis fully confirmed; removal of uterine appendages followed by recovery; patient doing exceedingly well in every respect; discharged from private hospital on twenty-sixth day.

CASE CXLIV.—Miss M. C. F., family history fairly good. One case phthisis on mother's side. Noticed enlargement left side abdomen about nine months previous—all symptoms of unilocular ovarian cyst; coeliotomy June 6, '94; removal left ovary and single cyst; diagnosis confirmed; simple operation in every respect; uninterrupted recovery. Patient left private hospital June 20, '94.

CASE CXLV.—Mrs. A. McN., possible history phthisis on father's side. Patient healthy and robust as a girl; menstruated at fourteen; caught cold; flow ceased, not re-establishing itself for over a year. Regular up to present trouble, which commenced in '87. Last noticed slight flow May, '94. Married twenty-two years; one child still-born, sixteen years ago. Supposed miscarriage about six years ago, at which time she suffered a great deal of bearing-down sensation and pain in lower portion abdomen and back. Œdema of ankle at times. Thinks enlargement abdomen increased slowly. More rapid for three or four months previous to operation, occurring right side first. Coeliotomy at own home June 16, '94. Multilocular ovarian cyst right side; short, broad pedicle; hemorrhage; recovery. Ligature came away latter part July. Patient developed symptoms phlebitis, but August, '94, around house and doing well.

(To be Continued.)

The Library of the Office of the Surgeon-General of the United States Army.—During the fiscal year ended June 30, 1894, there were added to the library of the surgeon-general's office 1,082 medical journals, 214 volumes of transactions, 346 bound pamphlets, 2,272 medical books of other kinds, 2,258 medical theses and 9,053 medical pamphlets. At the close of the year the library was in possession of 33,297 medical journals, 4,913 volumes of transactions, 1,663 bound theses, 2,604 bound pamphlets, 72,090 medical books of other kinds, 52,218 medical theses, and 127,560 pamphlets, a grand total of 183,778. The profession is justly proud of this great library and will resent any attempt to lessen its usefulness by curtailing its appropriation on the assumed ground of economy. The librarian, Dr. John S. Billings, and his assistants deserve great credit for their conduct of the library.—*Medical News.*

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ANNOTATIONS.

Trional as a Hypnotic.

BY DR. M. STEINER, OF ROSENBERG, O. S.

While, doubtless, the physician should preserve an attitude of reserve towards the many so-called new remedies in the market, since business interests often overshadow their true value, it must be conceded that many a valuable remedy remains unused because it has not been subjected to a thorough course of experimentation.

The necessity for a reliable and safe hypnotic is so urgent that every remedy recommended for this purpose should be given a trial, and if its efficacy be confirmed, the attention of the profession should be called to its merits.

With regard to trional, a drug related to sulfonal and which was discovered by Baumann and Kast in 1890, so many observations are at hand, confirmatory of its advantages, that there is nothing to prevent the general employment of this hypnotic. The aim of this article is to call attention to these advantages which are based upon a series of favorable therapeutic results.

My opinion is entitled to some consideration, since at one time I made sulfonal the subject of experimentation, the results of which were published in the *Therapeutische Monatshefte*, October, 1889. In comparing trional with sulfonal I would unhesitatingly give the preference to the former.

The hematoporphynuria which has been observed after long continued administration of both these drugs is of extremely rare occurrence, and usually preceded by constipation and oliguria. By attention to these conditions and by the employment of alkaline mineral water (seltzer, apollinaris, etc.), as recommended by Goldmann (*Therapeutische Monatshefte*, November, 1894), it can be prevented.

Aside from these rare sequela, trional is perfectly innocuous, both as regards the digestive, circulatory and respiratory functions, so that it is well adapted for pediatric practice. Dr. A. Claus (*Internat. Klin. Rundschau*, No. 45, 1894) has employed it in nervous affections of children attended with insomnia, especially in chorea, pavor nocturnus, convulsions, etc., in which it proved extremely serviceable. He administered it according to the age (from one to ten years) in doses of 0.2 to 0.5 gm., in hot milk, confections or honey.

I employed trional in the case of a very decrepit lady, aged seventy-four, who suffered from emphysema and passive renal congestion, giving it in 1.0 gm. doses at night. The results were excellent, both as regards the insomnia and the diuresis which was markedly increased, and a condition of euphoria, such as had been long absent, ensued.

After Barth and Rumyel had made the first trials with this remedy at the Hamburg hospital (*Deut. Medicin. Wochenschr.*, No. 32, 1890) their favorable results were confirmed by Schäfer (*Berlin Klin. Wochenschr.*, 1892) and others. Stieglitz (*New York Medic. Monatschr.*, No. 12, 1893) employed trional in fifty-eight cases of various diseases attended with insomnia, while previous observations had been almost exclusively made in cases of mental diseases. According to Stieglitz the chief field of usefulness of the

remedy is in simple agrypnia dependent upon cerebral neurasthenia or faulty habits of life. He found that in the agrypnia which is so frequently met with in hysterical women, especially during or shortly before the menstrual period, 1.0 gm. was usually sufficient to produce sleep of six to eight hours' duration. On the ground of his own observations and those previously published, Stieglitz concludes that trional is an hypnotic especially suitable for general practice, and that as regards promptness and certainty of effect, ease of administration and freedom from disturbance, it leaves much less to be desired than in the case of other hypnotics. Goldmann in a not inconsiderable number of cases of sleeplessness not produced by pains, especially neurasthenic insomnia, obtained sleep of six to eight hours' duration from the use of trional.

Taking into account the cases observed by me (chiefly neurasthenic women) I coincide completely in the conclusions of these authors. I would emphasize especially the rapidity or action of trional (ten to fifteen minutes) as compared with sulfonal, which produces sleep as late as two hours after its administration, which is more often followed by dyspeptic symptoms, and more frequently proves inefficient.

As regards dose, I also believe that 1.0 gm. is usually sufficient; an initial dose of 1.5 gm. acts too powerfully in most instances, the patients complaining of marked lassitude on the following day and refusing further use of the remedy, while the feeling of comfort produced by smaller doses constitutes a decided advantage of trional over other hypnotics.

Trional is more soluble than sulfonal and is more readily absorbed. It should be administered in hot milk, tea or soups, and, in order to prevent a diminution of the alkalinity of the blood, one or two bottles of some alkaline mineral water should be taken daily.—*Deut. Medicin. Wochenschr.*, No. 13, 1895.

Atropine as a Haemostatic.—The great value of atropine in the various forms of shock is generally recognized, while its hæmostatic properties in all forms of hemorrhage are not

so well known. Atropine, by its power to stimulate both the primary and secondary vasometer centres, and at the same time excite the cardio-innervating centre, tends to increase the power and efficiency of the heart's action. By its power to stimulate the innervating impulses distributed to the muscular coats of the arterioles and heart, the volumetric capacity of the arterial system is expanded, and more completely filled with blood, and in this way it is taken from the distended veins and the loss of blood is arrested. This change in the position of the bulk of the blood brings about lessened pressure in the veins, and a clot forms, the vessel closes and the hemorrhage ceases. As a hæmostatic in all kinds of hemorrhage, when the bleeding is of a passive nature, it is almost a specific. In epistaxis it is invaluable, if not specific, in doses one hundredth to a fiftieth of a grain given hypodermically as often as every twenty minutes, until the blood is completely stayed. Dmitrieff reports the successful management of two cases of metorrhagia by atropine.

In one case the hemorrhage persisted in despite the employment of the usual remedies, including the tampon, but ceased after the injection of one twenty-fourth of a grain of atropine. The second case was that of an anæmic woman, who became syncopal and cold from the loss of blood. The first injection was followed by improvement, and the third by the cessation of the bleeding. Atropine in hemorrhage has proven in my hands to be the best possible remedy. It is free from danger, acts immediately and can be used conveniently from the fact that most hypodermic cases contain the remedy. A trial will convince one of its great value.—J. Wellington Byers, M. D., in *Charlotte Medical Journal*.

Alcohol Free of Duty.—The Senate tariff bill admits free of duty alcohol to be used in the arts and for medicinal purposes. After its passage another bill was introduced in the House repealing this clause, but it has been shelved with the bills remitting the duty on sugar and raw materials.—*Medical Record*.

What Becomes of Old Diplomas?—An advertisement in a daily paper of recent date furnishes a partial solution of the problem as to what becomes of the diplomas of deceased physicians. The advertisement in question offered for sale the diploma of a physician who had recently died. The price asked was \$50. The advertiser, when he learned that such a sale would be contrary to law, discreetly withdrew his offer, which he said he had made on behalf of the widow.—*Medical Record*.

The Contribution of Medical Students to a City's Health.—In a speech made at a dinner in Edinburgh recently by Dr. Clouston, the statement was made that about \$750,000 came to Edinburgh every year from medical students, and that the process of making doctors was therefore of much pecuniary benefit to the city. On the other hand, medical labors and discoveries had brought about a decrease in the death rate of seven per cent during the last twenty-five years, with a corresponding decrease of sickness. Therefore in this way, also, the medical men had also contributed to the health as well as to the happiness of the city.—*Medical Record*.

A Certain Determination of Sex.—Dr. X, of Paris, has discovered an infallible method of determining the sex of the child in utero. After conscientious auscultation and palpation of Madame Z, he announces that "It will be a boy," and at the same time notes on his tablets: "Madame Z, a girl." When the accouchement takes place if the new-comer is a boy, well and good; if it is a girl he exhibits his tablets and assures the mother that she must have misunderstood him. It is not noted what his method is in multiple births.—*The Journal*.

Getting Ready for Cholera.—When cholera prevailed in France two years ago, the health authorities sent word to the mayor of a village in the threatened district to prepare for the disease. After a while he reported that he was ready, and upon inquiry being made as to what precautions had been taken, it was learned that a sufficient number of graves had been dug in the cemetery to bury every man, woman and child in the village.

REVIEWS AND BOOK NOTICES.

A Text-Book of Practical Therapeutics, with especial reference to the Application of Remedial Measures to Disease and their Employment Upon a Rational Basis, by Hobart Amory Hare, M. D., B. Sc., Professor of Therapeutics and Materia Medica in the Jefferson Medical College of Philadelphia. Fourth edition, enlarged and thoroughly revised. Philadelphia: Lea Brothers & Co., 1894.

The popularity of Hare's Practical Therapeutics is shown by the fact that since its presentation to the medical profession four years ago, it has been necessary to issue four editions.

This popularity is well deserved, as the book contains exactly what both physicians and students most need, and is not encumbered with spun-out dissertations nor useless materials.

A brief general contents of the work is as follows: General Therapeutical Considerations, pages 1-17; Drugs, 39-358; Remedial Measures other than drugs, 359-405; Foods for the sick, 406-664; Tables of doses of Medicine, 665-680; Tables of Relative Weights and Measures in the Metric and Apothecaries Systems, 681-882; Index of Drugs and Remedial Measures, 683-700; Index of Diseases and Remedies, 701-740.

It is a work that should be near at hand in every practitioner's office.

The Pocket Materia Medica and Therapeutics. A Résumé of the Action and Doses of all Officinal and Non-Officinal drugs now in common use. *By C. Henri Leonard, A. M., M. D.* Professor of the Medical and Surgical Diseases of Women and Clinical Gynæcology of the American Medical Association, etc., etc. *Second edition*, revised and enlarged; cloth, large 16 mo., 367 pages, price, post-paid, \$1.00, Detroit, 1895. The Illustrated Medical Journal Co., Publishers.

The second edition of this popular therapeutical work has had 67 pages added to it, besides typographical errors corrected, etc. A new and complete cross-index has been prepared, which renders the quick finding of a non-familiar possible. This is an important feature lacking in many ready-reference books. It is a "down-to-date book," and this with unique arrangement of its description of drugs and compounds secured for the first edition an order by cablegram for 1,000 copies from Baillière, Tindall & Co., one of the largest medical publishing houses in London; a compliment rarely paid any American book. It has also been a popular book with physicians, pharmacists and students on this side of the water, judging from the early exhaustion of the first edition.

The descriptive arrangement of the drugs is as follows: Alphabetically, the drug, with its pronunciation, (officinal or non-officinal standing indicated), genitive case-ending, common name, dose and metric dose. Then the English, French and German synonyms. If a plant, the part used, habitat, natural order, botanic description, with alkaloids, if any; if a mineral, its chemical symbol, atomic weight, looks, taste, how found, its peculiarities. Then the action and uses of the drug or compound, its antagonists, its incompatibles, its synergists and then antidotes. Then follow its officinal and non-officinal preparations with their medium and maximum doses. Altogether, it is a handy volume for physician, druggists or student, and will be frequently appealed to if in one's possession. We believe it to be the most complete and exact of any of the books of its class now issued, and its moderate price is to be commended.

Landmarks in Gynaecology.—By Byron Robinson, B. S., M. D., Chicago, Illinois, Professor of Gynaecology in the Chicago Post-Graduate School; volumes I and II, 1894. Geo. S. Davis, Detroit, Mich.

These two volumes are written in an interesting and instructive manner, and form a valuable addition to "The Physician's Leisure Library".

The "Landmarks" are discussed under the following heads; Anatomy; Menstruation; Labor; Abortion; Gonorrhœa; Tumors.

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Tuberculosis and Syphilis of the Larynx. Their Etiology, Diagnosis and Treatment.

BY C. F. THEISEN, M. D.

The object of this paper is not to advance any new theories but to give simply a brief review of the two diseases in question and to emphasize what is already known, particularly the surgical treatment of laryngeal tuberculosis, which I do not think has been given the attention it deserves by American laryngologists.

ETIOLOGY OF TUBERCULOSIS.

By laryngeal tuberculosis we mean all ulcerative processes in the larynx, which, the same as in the disease of the lungs, are caused by the invasion of the tubercle bacillus in the larynx. However E. Fraenkel* has demonstrated the frequent presence of the staphylococcus pyogenes aureus and streptococcus pyogenes, and as Hajek says, it is very probable that the acute œdemas which often occur in the later stages of a laryngeal phthisis and formations of ulcers, are in part at least the products of a secondary infection. The etiology, however, is by no means exhausted with our knowledge of the infecting cause, as it is as yet a disputed question in what way the tubercle bacillus gets into the tissues of the larynx. The question as to

*Zur Ätiologie der tuberculösen Kehlkopfgeschwüre. (Centrallblatt für klin. Med. 1889.)

whether the tuberculosis is primary or secondary is in such close relationship to this, that one can not well be separated from the other. Wilson, in Pepper's American textbook of the theory and practice of medicine, writes: "that after prolonged discussion it is finally conceded that tuberculous laryngitis may occur as a primary disease." Of course the great majority of the cases are associated with tuberculosis of the lungs. Heinze found in twelve hundred and twenty-six cases of tuberculosis that the larynx was affected in two hundred and seventy-six or 30 $\frac{6}{10}$ %; Mackenzie, in one hundred cases in the second and third stages of the disease, found changes in the larynx in seventy-one of them. From the twentieth to the fortieth year seems to be the time in which the disease develops most frequently. Heinze has found only nine cases in children under nine years of age. As a rule the disease commences in the lungs and later in the larynx. Those cases must also be regarded as secondary where tuberculosis of the lymph glands and, as Schnitzler has frequently observed, tuberculous caries of the bones have preceded the disease of the larynx. There is no doubt, however, that tuberculous laryngitis may occur as a primary disease, as every laryngologist has had the opportunity to observe tuberculous changes in the larynx without being able to determine the least trace of a pulmonary phthisis; however, small, centrally located tubercles may escape the notice of the best diagnostician so that the absence of physical signs in the early stages of a pulmonary phthisis is not proof that the disease may not be present. More weight must be attached to post-mortem examinations that have been made in these cases in which great tuberculous changes have been found in the larynx without any indication of the disease in other organs. Etiologically there is nothing in the way of our acceptance of a primary laryngeal tuberculosis, as the particles of dust which are constantly being inhaled and which often contain the bacilli, may easily lodge on a portion of the larynx where the epithelial layer is wounded and so later produce the tuber-

culous changes in the deeper tissues. In regard to the secondary tuberculosis, we only know positively that tuberculosis of the lungs very often leads to a similar disease of the larynx. But in what way the infection occurs is not so certain. There are two theories which the consensus of opinion to-day favors:

1. That the secretion from the lungs in its passage through the larynx infects this at a point where there is a loss of some superficial epithelium and so the bacillus gets into the sub-epithelial tissue and there produces the characteristic changes.

2. That the conveyance of the bacillus from the lungs to the larynx is by way of the blood and lymph channels. E. Fränkel* supports the first theory and claims that the tuberculous ulcers are mostly always due to this.

Admitting that this may be true in separate cases, it seems to me that the following facts favor the second theory—that of the propagation of the bacillus by way of the blood and lymph channels.* As Hajek states:

1. We often meet in the early stages of pulmonary tuberculosis, where a sputum that contains bacilli scarcely exists, with far advanced tuberculosis of the larynx. In these cases the sputum could hardly have been the infecting cause.

2. Türck, Schnitzler, and others have often noticed that the process in the lungs and in the larynx was on the same side. These observations have been so frequently made that they cannot be called mere coincidence, but would point to a direct transmission of the tuberculous matter through the lymph and blood channels or at least the lymph channels.

3. I have seen cases of far advanced disease of the lungs without any trace of tuberculous infection in the larynx. In these cases there is most always a chronic laryngitis, where a consequent loss of superficial epithelium is certainly always present and still the larynx was not affected.

*Fraenkel has found the tubercle bacillus in the epithelium of the surface and in the superficial layers of the mucous membrane.

*As the hip-joint and knee for example.

LASTLY—Heinze, Hajek and Korkunoff have made microscopic examinations of sections of a great many cases and have often found between the tubercle layer and the layer of superficial epithelium a layer of tissue which showed absolutely no changes. A microscopic section through the infiltrated tissue discloses that under a comparatively normal epithelium there is a dense cellular infiltration which is very often diffuse; at times there are certain parts made up of a denser infiltration, consisting for the most part of epithelioid cells and often containing giant cells; in short, they are to be regarded as tubercles. But Heinze and Korkunoff have found that between the epithelium and the upper edge of the tubercle layer there is a layer of normal tissue which is free from the cellular infiltration and only contains a few leucocytes.

Therefore I think we must agree with Heinze who regards such microscopic pictures as evidence, that the infection is conveyed through the lymph and blood channels, and that the tuberculous infiltration extends from the deeper tissues to the surface and not vice versa.

Korkunoff has never been able to determine the invasion of the tubercle bacillus from the surface of the epithelium.

ETIOLOGY SYPHILIS.

Primary syphilis of the larynx is extremely rare and even the few cases that have been reported were probably secondary to a pharyngeal infection. On the other hand, the secondary and tertiary symptoms seem to especially favor the larynx, and of these the secondary symptoms are much more frequently met with than the tertiary. Laryngeal syphilis is mostly met with in young adults and in middle age. John N. Mackenzie of Baltimore, first directed attention to congenital syphilis of the larynx in infants. According to him it does not occur so very infrequently, usually in the first year of life. Cough, dyspnœa, dysphagia and deep destructive ulceration are usually present. The characteristic secondary symptoms in the larynx usually appear between the sixth

month and third year, very seldom later, from the time of infection. They may appear as early as the third month. The tertiary symptoms on the other hand may appear after ten, twenty and even thirty years. Morrill Mackenzie states in hereditary cases he has never seen the disease before the seventh year; he also reports sixteen cases of tertiary laryngeal syphilis in persons over sixty. After the skin and pharynx the larynx is probably more frequently affected with syphilis than any other part of the body. Prof. Lewin, who has had probably the largest experience, states that in over twenty thousand cases of constitutional syphilis treated in Charité Hospital, Berlin, between 1863 and 1880, 2 $\frac{9}{10}$ % had laryngeal syphilis; Mackenzie, in ten thousand cases of the throat (pharynx and larynx), 3 $\frac{8}{10}$ % with laryngeal syphilis; Schrötter, in twenty-one thousand cases of throat affections, in 4 $\frac{5}{10}$ % laryngeal syphilis. According to Chiari and Hajek however, there are affections of the larynx which cannot always be diagnosed with certainty whether they are due to syphilis or not. Therefore statistics of the percentage of syphilis of the larynx during general syphilis or of the proportionate number of cases of laryngeal syphilis to all diseases of the larynx are much harder to gather in this disease than in others; an ordinary laryngitis and syphilis so frequently occur together that this is not surprising. Atmospheric conditions seem to have some influence in the development of laryngeal syphilis; thus in one hundred and sixteen cases of secondary syphilis reported by Mackenzie, seventy-nine occurred between the 1st of September and the 31st of March, and only thirty-seven between April 1st and August 31st, while of one hundred and ten cases of tertiary syphilis, sixty-six occurred in the six fall and winter months and forty-four during the spring and summer months. Lewin gives similar results. One reason why syphilis of the larynx frequently follows pharyngeal syphilis, is that the epiglottis comes in contact with syphilitic ulcers situated deep down in the pharynx, and that is also a reason why the epiglottis and laryngeal entrance are so often involved.

(Ziensen, Gottstein.)

The diagnosis of tuberculosis and syphilis of the larynx will be best given by the following case which it was my privilege to observe and treat for over over a year in the nose and throat clinic in which I worked in Vienna. I have gone into the case at some length, as it was one of the very rare conditions of mixed tuberculous and syphilitic infection of the larynx and lungs, which I think will prove of interest to the general practitioner as well as the specialist. From the time that I first saw the patient (September, 1893, to September, 1894) the diagnosis was very difficult as at times the symptoms were characteristic of syphilis and at other times of tuberculosis. The appearance of the ulcers in the larynx during life and the course of the disease pointed to a primary syphilitic followed by a tuberculous infection. The following is the patient's history: J. L., carpenter, aged 36, came to Vienna clinic September 30, 1893, for the first time; had hard chancre four years before. No other symptoms of syphilis, no eruption nor glandular enlargement. Patient stated that for some time he had noticed something wrong about the rectum, with some pain on defecation, as he thought, due to hemorrhoids. He complained of a burning and tickling in the throat, and pain in deglutition.

EXAMINATION.

Pharynx, negative. In the larynx on the left side of the epiglottis a large ulcer with considerable inflammation and thickening of the rest of the epiglottis; this was covered with a purulent secretion and had sharply defined edges; on account of its situation and the fact that it was a solitary ulcer and from the history of the case, the diagnosis of syphilis was made. Frequent examination of the lungs and sputum gave absolutely negative results. On examination of the anus there were seen several apparently typical syphilitic condylomata; several sharply defined nodules about the size of a split pea with soft surfaces; several had broken down forming deeper ulcerations, with irregular sharp edges and

secreting surfaces. He was given a spray of corrosive sublimate, ($\frac{1}{1000}$), local insufflations of calomel and iodide of potash internally, and with this treatment the ulcer rapidly healed. Patient now left clinic and did not return for two months, when he had the same symptoms—only in a more severe form and now, too, some cough and pain in the chest. On examination of the larynx there was seen another beginning ulceration upon the seat of the old ulcer, with a deep destructive ulcer on the right side and also on the oral surface of the epiglottis. Insufflations of iodoform were now given with iodide of potash internally, and for a short time there was some improvement. Mercurial plaster was applied to the condylomata ani. On examination of the lungs there was now found dullness and bronchial breathing; but this was under the angle of the scapula on the left side and not over the apex and as the local symptoms and condition of the lungs improved under the administration of large doses of iodide of potash, the condition was still considered to be due to syphilis. No tubercle bacilli were yet found in the sputum. The patient had now been away some time and returned for treatment in June, 1894, with now a great deal of cough and expectoration, much pain in the throat and great dysphagia. The ulceration in the larynx had spread very rapidly to the aryteno-epiglottidean folds, to the arytenoid cartilages and vocal cords, which were almost entirely destroyed. (In the accompanying cuts, Fig. 1 represents the larynx at the time of the first examination. In Fig. 2, the ulceration has involved almost the entire larynx.) His general condition

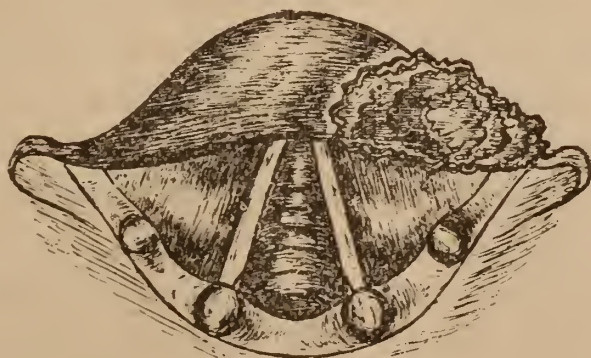


FIG. 1.

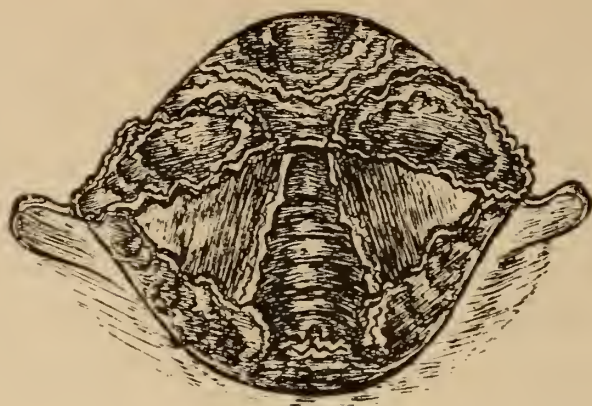


FIG. 2.

too became much worse. Dullness and bronchial breathing over most the whole lung, with fever, hæmoptysis, night sweats, diarrhœa, and now, too, tubercle bacilli were found in the sputum. Cough was very severe, with dyspnœa, which was often very great. He lost strength very rapidly, the ulceration in the larynx extended in all directions (treatment seeming to have no effect at all), and on the 5th of September, 1894, died under symptoms of general collapse. The post-mortem examination, made by Prof. Kolisko, proved that the whole process was tuberculous in nature, although the history of the patient, the condylomata, the location at first of the ulcers in the larynx, and the influence of the anti-syphilitic treatment, at least in the beginning, all pointed to syphilis. The case certainly shows how very difficult the differential diagnosis between tuberculosis and syphilis of the larynx often is. Hajek, E. Fränkel and Schnitzler, who have reported similar cases of mixed tuberculosis and syphilitic infection of the larynx, state: "That syphilitic ulcers form a very favorable soil for the development of the tubercle bacillus." And in this case certainly, it was very probable that in the beginning the ulcers in the larynx, the patches of the anus, and the condition of the lungs were syphilitic in nature and in the latter course of the disease the condition had become tuberculous.

The diagnosis then depends first upon the laryngoscopic picture from which alone it can often be made. When this is not sufficient a careful examination of the pharynx, lungs,

skin, etc., the history of the case, and finally an exact microscopic and bacteriological examination, will usually settle all doubts. Although a solitary ulcer first appearing on the epiglottis is usually syphilitic, tuberculous ulcers may appear there in the beginning. Syphilitic infiltrations may be mistaken for tuberculous ones, but tuberculous infiltrations are seldom so extensive in the beginning; in syphilis too, the surrounding mucous membrane, as well as that covering the infiltration, is reddened, while in tuberculosis it is markedly anæmic; in syphilis the infiltrations as a rule break down into deep ulcers very much sooner than in tuberculosis. Beginning carcinoma may be mistaken for syphilitic or tuberculous infiltration, but in carcinoma there is much infiltration of the surrounding tissue with an irregular, reddened, nodular surface. There is also much glandular enlargement in the neck very early. When still doubtful iodide of potash will usually clear up the diagnosis.

TREATMENT.

In the treatment of such combined cases of tuberculosis and syphilis of the larynx, the syphilis must receive the first consideration and an energetic anti-syphilitic treatment should be given even if tuberculosis is present at the same time; with a proper choice of the remedies and methods of treatment, not only the syphilis is cured, but the tuberculosis often benefitted.—*Schnitzler*.

Iodide of potash is the best remedy internally. In very anæmic patients iodide of iron is indicated. Locally, sublimate inhalations and insufflations of calomel, and where the process is not too far advanced, I have seen good results from this treatment. "Advanced cases are often benefitted by insufflations of iodoform or applications of strong solutions of lactic acid, in connection with a systematic anti-syphilitic treatment as inunctions or injections."—*Hajek*.

I will only mention briefly the treatment of uncomplicated cases of laryngeal syphilis. This must be primarily constitutional and secondarily local. Only in the cases where

there is great danger to life from dyspnœa resulting from perichondritis or œdema, or when cicatrices of old syphilitic processes cause stenosis of the larynx, is an energetic local treatment at once indicated. The constitutional treatment is the same here as when any other part of the body is affected. For the secondary symptoms the preparations of mercury are the best either in the form of inunctions, injections or administered internally.

Of these the best results are obtained from the inunctions and injections. Where there is perichondritis and œdema with a great deal of inflammation, Lewin has had good results from the subcutaneous injections of corrosive sublimate. He begins with from $\frac{1}{30}$ to $\frac{1}{10}$ gr. and this is repeated every four to eight hours, depending upon the severity of the case and the condition of the patient, until the dangerous symptoms are gone. Afterwards the dose is about $\frac{1}{60}$ gr. about once a day or once every two days. Lewin, in his enormous experience with over twenty-six thousand syphilitic patients in Charité Hospital, Berlin, has never had a death resulting from the use of this treatment even when pushed to the point of mercurial intoxication. The injections are then of course stopped. Under all of these cases he states there has been no death from laryngeal stenosis. Prof. Finger, of Vienna, employs the salicylate of mercury in oil of paraffine, fifteen grs. in about two ounces of the oil, and injects once a week one cubic centimeter (about sixteen minims) deeply into the muscles of the buttocks. In a number of cases in which I saw this treatment employed by Prof. Finger no bad effects resulted from the injections, very little irritation beyond at times slight tumefaction. This method has the advantage that it is cleanly and very quick in its action, one injection being as good as a good many inunctions. For the tertiary symptoms iodide of potash of course stands at the head. When syphilitic patches or ulcers are present, applying to these solutions of nitrate of silver 5 or 10 or even 20% every other day, or touching them with silver melted on the end of a laryngeal applicator is the best treatment. A very excel-

lent application is the iodide of glycerin solution: iodine 5 gr., iodide of potash 50 gr., and glycerine q. s. ad. 1 ounce.

Sublimate spray inhalations, ($\frac{1}{1000}$), have been particularly recommended by Schnitzler and are often very effective. Where an abscess has resulted from a perichondritis it must be opened; where dyspnœa is due to great œdema we must endeavor to relieve it by scarification. When this is not sufficient and suffocation is imminent, tracheotomy must be performed at once. However, the deepest and most destructive ulceration and even severe perichondritis get well with the administration of iodide of potash. Necrosis following perichondritis cannot always be prevented by this however. Syphilitic cicatrices have a special tendency to contraction and so produce stenosis of the larynx. The method of dilatation by means of the O'Dwyer tubes, using gradually larger ones as the stricture gets wider, or the dilatation by means of the Schrötter hard rubber bougies must be tried. In one respect I consider the method of Schrötter better than that of O'Dwyer for these cases; patients often become very expert in passing the bougies themselves and can leave them in place some time. There is, however, an objection to the use of any hard rubber instrument in the air passages, viz: that when they get old or if there is any defect in the instrument it may possibly break off and the piece drop down, which wouldn't be altogether a very pleasant experience. Finally, from time to time, tonics are indicated. Smoking, the use of alcoholic stimulants and all things which tend to irritate the larynx are of course contra-indicated.

In conclusion I would like to give a brief résumé of the various methods of treatment which have been employed in laryngeal tuberculosis. With our present knowledge of tuberculosis of the larynx there is no doubt that tuberculous ulcers can be healed.

The question as to whether laryngeal tuberculosis is curable is another thing entirely. As this is in such close relation to the question as to the curability of tuberculosis of the lungs, it must be admitted, that as long as the latter has

not been permanently cured, there is no surety that every tubercular invasion in the larynx has been done away with, or that new ones may not follow. Diet and general constitutional and hygienic measures are just as important in the disease of the larynx as of the lungs. The diet is of great importance and this should be a mixed one. Moritz Schmidt truly states "that with only meat and eggs a phthisical patient is fed to death." As Gottstein says: "The physician should not be particular in his choice of food. The taste and usual mode of life of the patient so far as it is not irrational, should be changed as little as possible. Regularity in meals and the greatest possible variety in diet is of advantage." Particular attention should be given to the disease of the larynx; all solid and liquid foods which, either through their temperature or chemical nature could cause an irritation of the larynx, should be avoided. I have found that cool drinks and food are usually better borne than hot; hot drinks often causing great pain. In bad ulceration of the epiglottis it is sometimes necessary to feed the patient through an œsophageal tube, which if not too thick may be easily passed. In ulceration of the epiglottis especially, only such nourishment should be given that can easily be swallowed, as soft boiled rice, broths, soft eggs, etc., ice cream and ices are often very grateful. In the early stages the skin of tuberculous patients should be hardened as much as possible by daily washing (and rubbing dry with a rough towel) of the chest and neck in cold water. In weakened patients it is better to begin with luke-warm water and gradually get up to the cold. Alcoholic beverages are often of absolute necessity although where there is ulceration of the epiglottis, wines and beers often cause great pain; when given it is best to dilute the wine. Milk is undoubtedly one of the best nourishing agents we possess in the treatment of laryngeal tuberculosis and it should be given in large quantities, best during and shortly after each meal. Malt extracts are often very good and during the winter of course, cod liver oil. The patient should get accustomed to take a walk every day when the weather

is not too bad. If the daily sponging of the chest is done the sensitiveness to changes in temperature will be much diminished and the paroxysms of coughing which many patients have as soon as they get out in the air will also often be done away with. The late Prof. Gottstein in his excellent work on the larynx especially recommends "lung gymnastics" (as he calls them) for tuberculous patients. They consist of the patient every time he is out walking to take deep inspirations, drawing the air through the nose if possible, and keeping the lungs expanded for a few seconds before expiring the air.

Finally—the question of a change of climate arises: so much has been written on this subject that it seems almost presumptuous to dwell on facts which are so well known; but if only to make this article more complete, I will add that in the early stages of laryngeal tuberculosis the benefits arising from a change of climate are unquestionable. When the patient can afford to do this his life can often be greatly prolonged, in fact, in cases that are not too far advanced cures may sometimes be accomplished. But the sojourn in a favorable climate must often be prolonged for years to accomplish such favorable results. As however few have the means to go away for such a length of time, the physician should give them the best treatment possible in the way of nourishment, exercise and regulation of the hygienic conditions at home. Tuberculous patients in advanced stages of the disease are better off at home anyway. They do not bear the fatigue of a long journey well, nor do they feel well in the very best institutions. When possible the patient should get away during the summer months, if only to the nearest country region. This should be as free from dust as possible and should be well wooded, particularly with pine.

It is important for patients to avoid anything which tends to irritate the larynx—therefore the voice should be used as little as possible and when it is necessary to speak to do so in a whisper. Smoking and staying in a smoky room is contra-indicated.

Lastly—I will briefly go over the local and most important treatment of tuberculosis of the larynx.

Where the condition in the lungs is not too far advanced, great benefit is given by a proper local treatment. However with the healing of the tuberculous ulcers the condition in the larynx is by no means done away with, as recurrences occur in the great majority of the cases. The local treatment differs according to the stage of the disease and the anatomical changes that have taken place. In the beginning where there is a simple catarrhal condition, without symptoms of tuberculous infiltration, the best results are obtained with astringent solutions as silver nitrate. These will also be found to be effective for the dry short cough and for the parasthesia which are so often present. When infiltration has occurred the astringent solutions are of not much good. Here insufflations of iodoform and iodol are often very good. Iodol has the advantage of being without odor or very little, and has not the nauseating effect of iodoform. If either of these is employed, it must be used thoroughly, that is, a good deal of the powder must be blown into the larynx at each sitting; the mucous membrane and particularly the infiltrated portions of the larynx must be well covered with the powder and not as is so often done, one powder blower full or from 3 to 4 grains blown in, some of which usually getting into the œsophagus as well, and as a rule only a little into the larynx.

Antiseptics are very useful in the treatment of tuberculous ulcers and I have seen very good results from the use of carbolic acid used either in the form of inhalations or applied directly to the ulcers in the form of carbo-glycerine in 6 or 10% solution. Prof. Gottstein had the best results with this and has found it also good for relieving the pain. Lately the iodine trichloride has been used by F. Ingalls, Chicago, in the form of spray and hypodermically. He uses 1 to 2 grains to the ounce of distilled water and has administered 10 to 20 minims hypodermically with favorable results.*

*Diseases of Chest, Nasal Cavities and Throat, 1894.

M. Schmidt uses balsam peru in inhalations and Schnitzler uses it in connection with collodium to cover the tuberculous ulcers. Pyoktannin has been used a good deal by Scheinmann who has had good results with it. He heats the end of a laryngeal sound, dips this into the pure powder and applies it directly to the ulcers, first cocainizing thoroughly. Dr. W. F. Chappell (New York Medical Journal, March 30, 1895) speaks of a new treatment of laryngeal tuberculosis by the application and submucous injections of creosote. In his report of seven cases treated in this way, with in some cases the internal administration of large doses of creosote, he gives very favorable results in most of the cases. Störk is against the treatment of laryngeal and pulmonary tuberculosis with creosote; he is of the opinion that it is very injurious to the functions of the stomach and intestines and that a good many patients die quicker with its use than if it had not been employed (Internat. Centralblatt Laryngol. & Rhinol. Feb. 1895—155).

After Von Mosetig, of Vienna, had employed with advantage lactic acid in the treatment of caries fungosa and lupus vulgaris and had observed that it possessed the property to destroy only the pathological tissue and leave the healthy intact, it was tried by Krause in the treatment of the tuberculous ulcers of the larynx and in him has found an enthusiastic supporter. The best results in the local treatment have been produced by this and the operative procedures. To get the patient accustomed to the use of lactic acid it is well to begin with a weaker solution (15 or 20%)—first rendering the larynx insensitive by applying a 15 or 20% solution of cocaine—then gradually increase the strength of the lactic acid as high as an 80% solution. The acid in order to be of benefit must be applied directly to the tuberculous ulcers, best with a laryngeal brush.

Rosenberg uses menthol a 20% oily solution and has seen the ulcers heal and a cicatrix form in from four to six weeks. As Jonathan Wright in a recent article in the N. Y. Med. Journal states: "at the present time the surgical treatment of

tuberculous laryngitis is the most important therapeutic question with which laryngologists are concerned" (N. Y. Med. Journal, Mar. 16, 1895).

Moriz Schmidt was the first to employ the operative treatment in tuberculosis of the larynx. Where there was an infiltration of the epiglottis or ary-epiglottic folds for example he made deep multiple incisions into the infiltrated tissue. Heryng and Krause followed in the same line, but where the multiple incisions didn't do any good Heryng thoroughly curetted out the infiltrated tissue and then cauterized with lactic acid. Heryng in an experience with over three thousand cases of tuberculosis of the larynx has employed the surgical treatment in two hundred and seventy, of these many cases were very severe, with far advanced disease of the lungs, dysphagia and hoarseness, and in many the larynx remained healed for at least a year. "Heryng rightly states that in favorable cases with the surgical treatment tubercular affections of the larynx can be healed. The dysphagia most always yields to surgical treatment and can perhaps only be relieved by it. Of course the result of the surgical treatment depends upon many other circumstances. Hemorrhages seldom occur except in hard infiltrations of the ventricular bands. When they do they can be controlled by li.q ferri sesquichlorat, or an 80% solution of lactic acid. He says the operative treatment is contra-indicated in total tuberculous infiltration of the larynx far advanced disease of the lungs, miliary tuberculosis, ulcers of the trachea, tuberculosis of the intestines or bladder, or general cachexia. Heryng expects therefore, that most laryngologists should employ this method of treatment, as the local healing of the tuberculous process was also proven with the microscope" (Chiari. in Inter. Centralblatt Laryngol. & Rhinol. Nov. 1894—145). Heryng further states that in hard infiltrations of the ventricular bands it is better to use electrolysis or the galvano-cautery so as to avoid hemorrhage. I have seen the best results from this combined surgical and lactic acid treatment. I have used this method in ten cases of tuberculosis of the larynx in the nose and throat clinic of

Prof. Chiari and other clinics in Vienna. In three cases there was a decided improvement in the condition of the larynx and in one case the ulcers partly healed and at least as long as I had the opportunity to observe the case there was no recurrence. Since writing this article I have employed this method in one case in private practice (an inter-arytenoid ulceration). The dysphagia was very much relieved and the voice benefited a little but otherwise there was not much improvement. This treatment is only available where the process in the larynx has not become too extensive and where the entire tuberculous infiltration can be thoroughly removed. The operation is done as follows: The larynx is first thoroughly cocaineized with a 20% solution of cocaine, then the Türck double curette is employed and as much of the tuberculous infiltration as the patient can bear at one sitting is removed. For large tuberculous infiltrations between the arytenoids I like the Krause double cutting punch the best; a strong solution of lactic acid is then applied to the wounded surface—iodoform emulsion may also be used but it is not so effective. Patients bear this operation very well; the pain following it is not severe as a rule and can be easily relieved with cocaine, insufflations of powders containing morphine or hypodermics of morphine. A number of sittings may be necessary to remove all the tuberculous infiltration. An operation like the above can be done every week until the infiltrated tissue is removed without causing much distress and the subsequent relief to the patient is as a rule very great. The operation is contra-indicated in far advanced disease of the lungs with formation of cavities, in bad feverish conditions and where the disease in the larynx has extended below the vocal cords to the trachea. Eichhorst in his "Specielle Pathologie und Therapie" states that he has noticed spontaneous healing of tuberculous ulcers in a number of cases that had resisted every treatment.

Finally—where there is œdema or abscess due to perichondritis and where there is great dyspnoea due to severe stenosis, tracheotomy should be performed in preference to

other operations. M. Schmidt and Beverley Robinson have employed this as a curative measure even in cases unaccompanied by œdema. In fifteen tracheotomies, Schmidt has succeeded in curing five cases of advanced disease of the larynx for a long period (three years). Stein and Lazarus recommend the operation even where the larynx is slightly affected. In these cases I think with a sufficient technical skill and a proper understanding of the use of the instruments the endolaryngeal operation is better.

For the very bad advanced cases tracheotomy is of advantage as it puts the larynx at rest—and prevents irritation due to dust and the forcible inspiration of air as in dyspnœa. Extirpation of the larynx has been performed in a few cases by Gussenbauer, E. Fraenkel, Massei and Betz, but the results, mostly, have been so unsatisfactory that the operation is now rarely done.

With all the above mentioned forms of treatment, a symptomatic treatment is of course necessary as well. Where there is great pain in swallowing—insufflations of a powder of starch or iodoform with morphine once or twice a day or subcutaneous injections of morphine near the larynx often cause great relief.

Just before meals a 10% solution of cocaine may be applied to the throat, but the effects of cocaine are not as lasting as morphine. A powder consisting of boric acid, 2 drachms, starch $\frac{1}{2}$ drachm and morphine muriate 6 grains, and about 3 grains of the mixture blown into the larynx once or twice a day will cause a good deal of relief.

For the catarrhal processes of the larynx and bronchi which accompany the tuberculosis—inhalations of oil of turpentine, eucalyptol, creosote, bals. Peru, or alkaline solutions, as *natr. bicarb.* or sodium chloride are very good. They serve to loosen and so aid the patient in expectorating the often very tenaceous secretions and in this way greatly relieve the cough and difficulty in breathing.

I do not think that this article could be better brought to a close than by quoting from Prof. Gottstein's article on

laryngeal tuberculosis: "It is to be regretted," he says, "that the local treatment of laryngeal tuberculosis has not received among physicians the recognition it deserves. In spite of all scepticism which we have against the healing of laryngeal phthisis by our therapeutic measures, still we consider nihilism in this altogether unjust and dangerous. A rational, careful, topical treatment not only frequently very much diminishes the great suffering of patients afflicted with laryngeal tuberculosis, but it also has a good moral effect, in that it arouses hope in the unfortunate sufferer." And I certainly believe, when we consider that primary tuberculosis of the larynx does occur, that deep-seated changes take place with relatively slight disease of the lungs, that every attempt which has for its object the removal from the body of a localized source of infection, is a rational one.

The Four Years' Course.—Word comes to us that the rapid lengthening of the two years to three and now four courses of lectures as a requirement for graduation is producing hard times in some medical colleges, and will be the cause of a diminution in the number of existing schools of medicine. In some quarters this is a seeming hardship, but, after all, the process is one highly beneficial to the medical profession.—*The Lancet-Clinic*.

Report of One Hundred and Forty-Five Operations Done for the Removal of Ovarian Tumors and Pathological Conditions Associated with the Ovaries and Uterine Appendages Only.

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CONTINUED FROM PAGE 281.

An abstract of this paper was read at the meeting of the American Association of Obstetricians and Gynecologists, Toronto, Canada, September 19th, 1894.

NO.	NAME.	PHYSICIAN AND RESIDENCE.	AGE. CIVIL CON.	DIAGNOSIS OF DISEASE.	DATE OF OPERATION.	NATURE OF OPERATION. REMOVAL.	RESULT.	REMARKS.
1	Mrs. C. C.	Dr. Weidman, Medusa, N. Y.	52 M	Multilocular ovarian cyst.	Feb. 20, 1888.	Multilocular cyst right ovary. Papillomatous. Many adhesions. Short, broad pedicle.	D	Patient died 4th day from intestinal obstruction. Autopsy, obstruction due to loop small intestine, attaching itself to stump pedicle.
2	Mrs. S. B.	Dr. Glidden, Little Falls, N. Y.	37 M	Unilocular ovarian cyst.	Feb. 24, 1888.	Diagnosis confirmed. Weight 20 lbs.	R	Uninterrupted recovery.
3	Mrs. F. C.	Dr. Houston, Cohoes, N. Y.	68 M	Multilocular ovarian cyst. Sarcoma of mesentery.	April 9, 1888.	Multilocular cyst and uterine appendages. Drainage.	R	Patient in good health six months after operation.
4	Miss C. D.	Dr. Bush, Springfield, N. Y.	24 S	Double pyosalpinx, cystic degeneration ovaries.	May 1, 1888.	Uterine appendages.	R	Stitch-hole abscess sixth day. Finally good union and excellent recovery.
5	Mrs. L. W.	Dr. Wright, Canaan, N. Y.	43 M	Unilocular ovarian cyst.	May 15, 1888.	Unilocular cyst, right ovary.	R	Uninterrupted recovery.
6	Mrs. A. M.	Dr. Hotaling, W. Township, N. Y.	46 M	Unilocular cyst, left side.	May 31, 1888.	Unilocular cyst, left ovary; also right ovary. Many adhesions. Weight 35 lbs.	R	Hypodermic injection morphia every six hours for 24 hours, then discontinued.
7	Mrs. A. O'C.	Dr. Grover, Port Henry, N. Y.	46 M	Multilocular ovarian cyst. left side.	May 31, 1888.	Multilocular cyst left ovary also right ovary. Many adhesions to intestines and bladder. Weight 20 lbs.	R	Temperature rose on the 8th day to 102-104-5 deg., returning to normal on 12th day after tarry, fetid discharge from vagina. No suppuration.
8	Mrs. P. A. R.	Dr. Wheeler, Pittsfield, Mass.	55 W	Double multilocular ovarian cyst.	July 5, 1888.	Diagnosis confirmed. Some intestinal adhesions giving rise to considerable hæm., requiring several ligatures. Weight, 40 lbs.	R	Uninterrupted recovery.
9	Miss E. B.	Dr. Montgomery, Lu Verne, N. Y.	26 S	Many attacks pelvic peritonitis. Salpingitis.	Oct. 1, 1888.	Uterine appendages. Operation difficult.	R	Good recovery. Two years later patient died from what at time supposed to be sarcoma of cavity of pelvis.
10	Miss M. W.	Dr. Melick, Fort Edward, N. Y.	20 S	Unilocular ovarian cyst, left side.	Oct. 4, 1888.	Diagnosis confirmed.	R	Death on 14th day from general peritonitis. Autopsy revealed evidence pelvic hæm. probably caused by ligature becoming loosened in some way.

11	Mrs. C. W.	Dr. Noble, Cairo, N. Y.	34 M	Multilocular cyst.	Multilocular ovarian cyst.	Nov. 19, 1888.	Multilocular cyst, left ovary. Right healthy, not removed; drainage for 48 hours.	R	Uninterrupted recovery.
12	Mrs. H. T. T.	Dr. Johnson, Belleayre, N. Y.	37 M	Multilocular cyst.	Multilocular ovarian cyst.	Dec. 21, 1888.	Diagnosis confirmed, 12 qts. fluid.	R	Uninterrupted recovery. Patient in good health, June, 1894.
13	Mrs. H. M. R.	Dr. Reiley, Fair Haven, Vt.	29 M	Salpingitis.		Dec. 22, 1888.	Uterine appendages.	R	Good recovery. Patient had met- rorrhagia for six months after op- eration; finally, complete recov- ery.
14	Mrs. E. B.	Dr. Vander Veer, Albany, N. Y.	39 M	Pelvic or abscess.	Pelvic or psoas abscess.	Jan. 4, 1889.	Pyosalpinx. One ovary and tube. Drainage.	R	Drainage continued for over two weeks.
15	Mrs. N. M.	Dr. Lape, Fair Haven, Vt.	26 M	Tubercular periton- itis.	Tubercular periton- itis.	Jan. 5, 1889.	Right ovary and tube. Drainage.	R	Mass removed proved on examina- tion to be tubercular. Glass drain- age gave much discomfort and 4th day replaced by rubber tube, this removed on 12th day.
16	Miss I. R.	Dr. Du Bois, Albany, N. Y.	26 S	Salpingitis. peritonitis.	Pelvic peritonitis.	April 5, 1889.	Uterine appendages.	D	Death from peritonitis on 11th day, Possibly obstruction.
17	Mrs. M. E. H.	Dr. Wheeler, Chatham, N. Y.	45 M	Multilocular cyst.	Multilocular ovarian cyst.	April 12, 1889.	Cyst and ovaries.	R	Uninterrupted recovery.
18	Mrs. E. C.		26 M	Multilocular cyst, left ovary.	Multilocular cyst, left ovary.	May 21, 1889.	Diagnosis confirmed. Right ovary in state cystic degenera- tion and removed. Drainage.	R	Uninterrupted recovery.
19	Mrs. F. W.	Dr. Van Vranken, West Troy, N. Y.	49 M	Unilocular cyst, left ovary.	Unilocular cyst, left ovary.	June 15, 1889.	Multilocular cyst, left ovary. Drainage.	R	Good recovery but patient suffered from hernia six months after op- eration.
20	Mrs. B. A.	Dr. Maxon, Chatham, N. Y.	22 M	Unilocular cyst.	Unilocular ovarian cyst.	Aug. 20, 1889.	Unilocular cyst left ovary also right ovary. Very adherent.	D	Death from shock.
21	Mrs. E. B.	Dr. Fuller, Huntsville, N. Y.	47 M	Multilocular cyst, left ovary.	Multilocular cyst, left ovary.	Sept. 23, 1889.	Cyst and uterine appendages. Colloid degeneration. Drain- age.	R	Uninterrupted recovery.
22	Mrs. C. L.	Dr. A. Boyce, E. Schodack, N. Y.	63 M	Multilocular cyst.	Multilocular ovarian cyst.	Oct. 14, 1889.	Diagnosis confirmed. Many ad- hesions. Drainage.	R	Severe vomiting for 48 hours after operation. Drainage quite free. Excellent recovery.
23	Mrs. C. C.	Dr. Johnson, Champion, N. Y.	59 M	Unilocular cyst, right ovary.	Unilocular cyst, right ovary.	Oct. 15, 1889.	Diagnosis confirmed.	R	Uninterrupted recovery.

ÖZ	NAME.	PHYSICIAN AND RESIDENCE.	AGE. CIVIL CON.	DIAGNOSIS OF DISEASE.	DATE OF OPERATION.	NATURE OF OPERATION. REMOVAL.	Result.	REMARKS.
24	Mrs. M. B.	Dr. Layman, Middleburg, N. Y.	47 M	Unilocular cyst, left ovary.	Oct. 29, 1889.	Diagnosis confirmed.	R	Uninterrupted recovery.
25	Mrs. R. H.	Dr. J. Babbitt, Cooperstown, N. Y.	36 M	Pelvic peritonitis. Salpingitis.	Nov. 4, 1889.	Adhesions loosened but too severe for removal of appendages.	R	Good recovery. Patient very much improved in health, one year after operation.
26	Mrs. R. A.	Dr. Best, Middleburg, N. Y.	35 M	Unilocular cyst, left ovary.	Nov. 11, 1889.	Unilocular cyst, left ovary; also right ovary.	R	Uneventful recovery.
27	Mrs. D. S.	Dr. Allen, Greenbush, N. Y.	37 M	Supposed, large ovarian cyst.	Nov. 13, 1889.	Incision. Right ovary removed. Tubercular peritonitis.	R	Error in diagnosis. Patient died later on of return of peritoneal dropsy.
28	Mrs. S. N. from Montana.	Dr. St. J. Middle, Brunswick, N. Y.	32 M	Large unilocular cyst right ovary.	Dec. 5, 1889.	Unilocular cyst, right ovary; also left ovary. Cyst 22 lbs.	R	Chill on 4th day controlled by quinine. Uninterrupted recovery followed.
29	Mrs. H. N.	Dr. Hall, W. Hartford, N. Y.	34 M	Chronic ovaritis. Pelvic peritonitis.	Jan. 27, 1890.	Uterine appendages.	R	Uneventful recovery.
30	Mrs. A. McK.	Dr. Turner, Mineville, N. Y.	20 M	Chronic ovaritis.	Feb. 23, 1890.	Uterine appendages, cystic degeneration of ovaries. Many adhesions.	R	Good recovery.
31	Mrs. E. H.	Dr. Dunlop, Waterford, N. Y.	55 M	Multilocular cyst, left ovary.	April 30, 1890.	Diagnosis confirmed. Hard mass on right side not disturbed.	R	Good recovery. Hernia observed one year after operation, not troublesome. Hard mass still observed 2 years, 6 months after operation, not enlarging. Ligature came away, July, 1890.
32	Mrs. J. V.	Dr. Traver, Troy, N. Y.	30 M	Multilocular cyst, left ovary.	April 30, 1890.	Diagnosis confirmed. Drainage removed on seventh day.	R	Excellent recovery, although long search had to be made, for sponge lost in cavity.
33	Miss A. O.	Dr. Pearson, Schenectady, N. Y.	30 S	Chronic ovaritis. Dysmenorrhœa.	June 16, 1890.	Uterine appendages.	R	Uninterrupted recovery.
34	Mrs. E. C.	Gray, N. Y.	34 M	Unilocular ovarian cyst.	Sept. 20, 1890.	Multilocular cyst, right ovary. Parovarian cyst, left side.	R	Uneventful recovery.

35	Miss L. McC.	Dr. Young, Glenville, N. Y.	23 S	Chronic salpingitis. Left ovary cystic. Retroversion.	Oct. 7, 1890.	Right ovary and tube, March, '89, had been to Seney hospital, N. Y., and Alexander's opera- tion done by Dr. Pitcher.	R	Recovery uninterrupted.
36	Miss M. G.	No. Easton, N. Y.	18 S	Multilocular cyst, right ovary.	Oct. 10, 1890.	Diagnosis confirmed. Left ovary healthy, not removed.	R	Good recovery. Apposition lower angle wound not perfect, silk- worm gut. Exuberant granula- tions.
37	Mrs. E. W.		24 M	Chronic salpingitis. Pelvic peritonitis.	Oct. 21, 1890.	Right ovary and tube. Left healthy.	R	
38	Mrs. S. K.	Dr. Bissell, Troy, N. Y.	33 M	Pyosalpinx double.	Oct. 30, 1890.	Uterine appendages and a small fibroid fundus of uterus. Drainage.	R	Free hæm. from fundus uterus when fibroid removed, controlled by thermo-cautery. Ligature came away 8 weeks after operation. Re- covery uneventful.
39	Mrs. F. M.	Dr. Matte, No. Adams, Mass.	35 M	Ovaritis; salpingitis.	Nov. 20, 1890.	Uterine appendages.	R	Patient made a slow but good re- covery.
40	Mrs. J. E.	Dr. Kathan, Schenectady, N. Y.	26 M	Ovaritis, right side.	Dec. 18, 1890.	Right ovary size turkey egg and tube.	R	Quick recovery. Two years after pa- tient became pregnant, passed through successfully, delivered of living child. Excellent health since.
41	Miss E. K.	Dr. Vander Veer, Albany, N. Y.	33 S	Unilocular ovarian cyst, probably left.	Jan. 3, 1891.	Unilocular cyst, left ovary and uterine appendages. Drainage.	R	10th day lower end incision opened and from 4 to 5 ounces fetid pus discharged. Irrigation tract of drainage tube. Good recovery.
42	Miss M. G.	Valley Falls, N. Y.	20 S	Tubercular peritonitis. Left ovary enlarged.	Jan. 14, 1891.	Left ovary and tube. Drainage.	R	Good recovery. Patient in excellent health, June, 1894.
43	Miss J. S.	Dr. Vander Veer, Seward, N. Y.	19 S	Unilocular cyst, left ovary.	Feb. 28, 1891.	Diagnosis confirmed. Right ovary, cyst and incised.	R	Immediate hæm. due to slipping of ligature, abdomen re-opened, pedicle re-ligated. Two pints sa- line solution poured into peritoneal cavity.
44	Mrs. A. E.	Albany, N. Y.	20 M	Multilocular ovarian tumor.	March 3, 1891.	Mass from left side sarcoma; cyst from right ovary. Drain- age.	R	Patient did well. Able to do her work for more than a year. 2d op- eration; removal part of new growth. Living June, 1894, with fistulous tract from which pro- truded sarcomatous mass.

NO.	NAME.	PHYSICIAN AND RESIDENCE.	AGE. CIVIL. CON.	DIAGNOSIS OF DISEASE.	DATE OF OPERATION.	NATURE OF OPERATION. REMOVAL.	RESULT.	REMARKS.
45	Mrs. N. A.	Dr. Stickles, Philmont, N. Y.	30 M	Hæmatosalpinx.	March 18, 1891.	Uterine appendages. Right side extra-uterine pregnancy.	R	Patient had regular menstrual flow for more than a year, then cavity uterus thoroughly cured, packed with iodoform gauze when flow ceased and she has remained well since.
46	Mrs. M. S.	Dr. Rulison, Amsterdam, N. Y.	44 M	Multilocular ovarian cyst.	April 23, 1891.	Multilocular cyst, left ovary. Right ovary undisturbed	R	Ligature came away nearly 6 months after operation; sinus readily healed. In good health August, 1891.
47	Mrs. E. C.	Dr. Babcock, Albany, N. Y.	33 M	Chronic ovaritis.	May 1, 1891.	Uterine appendages. Extensive adhesions. Drainage.	R	Good recovery. Hernia one year after operation.
48	Mrs. A. McC.	Dr. Webster, Schuylerville, N. Y.	32 M	Chronic ovaritis and pyosalpinx. Specific.	May 22, 1891.	Uterine appendages.	R	Good recovery from operation, but complained for over two years of old feeling; weakness about pelvis and pain in back.
49	Mrs. E. C.	Dr. Neher, Nassau, N. Y.	33 M	Chronic ovaritis and pyosalpinx.	May 27, 1891.	Uterine appendages. Drainage.	R	Good recovery. Patient had undergone operation for lacerated cervix 3 months previously. Excellent health Aug., 1891.
50	Mrs. E. B.	Dr. McHarg, Albany, N. Y.	28 M	Multilocular ovarian cyst.	May 30, 1891.	Multilocular cyst and both ovaries. Drainage.	R	Excellent recovery.
51	Miss L. M.	Dr. Church, Oneonta, N. Y.	26 S	Cystic degeneration ovaries and salpingitis.	July 13, 1891.	Uterine appendages.	R	Good recovery—somewhat slow. In excellent health, Aug., 1891.
52	Mrs. A. E. B.	Dr. Bigelow, Albany, N. Y.	42 M	Multilocular ovarian cyst. Peritonitis.	Sept. 1, 1891.	Multilocular cyst, left ovary and right ovary. Cyst suppurating Drainage.	R	Excellent recovery and in good health, June 1891.
53	Mrs. M. M.	Dr. Felter, Troy, N. Y.	32 M	Unilocular cyst, left ovary.	Oct. 1, 1891.	Left ovary, also hydrosalpinx, right side.	R	Good recovery. Patient in good health one year afterwards.
54	Mrs. V. S.	Dr. Nichols, Worcester, N. Y.	53 M	Ovarian cyst, right side.	Oct. 6, 1891.	Unilocular cyst, right ovary. 6 qts. fluid.	R	Excellent recovery and in good health two years after operation.
55	Mrs. A. R.	Dr. Mambert, Rondout, N. Y.	55 M	Multilocular ovarian cyst.	Oct. 6, 1891.	Suppurating cyst and both ovaries. Drainage.	R	Excellent recovery.

56	Mrs. N. P.	Dr. Lamont, Catskill, N. Y.	31 M	Supposed suppurating ovary, right side.	Oct. 8, 1891.	Incision; great adhesions of intestines. Large abscess. Drainage.	R	One year after operation developed second abscess, producing septicæmia, from which she died.
57	Mrs. E. J. L.	Dr. Magee, Lansingb'gh, N. Y.	30 M	Unilocular ovarian cyst with peritonitis.	Oct. 15, 1891.	Cyst and both ovaries.	R	Good recovery. In excellent health two years after operation.
58	Miss I. R.	Dr. Salmon, Lansingb'gh, N. Y.	19 S	Chronic ovaritis Dysmenorrhœa.	Oct. 19, 1891.	Uterine appendages. Atrophy of both ovaries.	R	Very good recovery but died one year after from cancer in stomach. Vomiting almost continually for 3 months previous to death.
59	Miss L. L. McC	E. Glenville, N. Y.	24 S	Cyst of left ovary.	Nov. 9, 1891.	Cyst left ovary like small orange.	R	Second operation. (See case 35) Patient in excellent health, Aug. 1894.
60	Miss K. E. M.	Dr. Bigelow, Albany, N. Y.	23 S	Unilocular ovarian cyst	Nov. 24, 1891.	Unilocular cyst, left ovary. Right ovary cystic and removed.	R	Excellent recovery.
61	Mrs. M. J. V.	Dr. Gray, Cambridge, N. Y.	40 M	Unilocular ovarian cyst.	Dec. 7, 1891.	Unilocular cyst, left ovary.	R	Excellent recovery.
62	Mrs. L. McK.	Dr. Vander Veer, Albany, N. Y.		Cystic degeneration ovaries. Pelvic peritonitis salpingitis.	Dec. 7, 1891.	Uterine appendages.	R	Excellent recovery.
63	Mrs. M. B. M.	Dr. Pond, Proctor, Vt.	33 M	Pelvic peritonitis. Pyosalpinx.	Dec. 14, 1891.	Uterine appendages. Many adhesions. Atrophy both ovaries. Drainage.	R	Excellent recovery. Patient relieved promptly from all sufferings. November and December, 1893, quite a flow each month. Excellent health since, last seen, May, 1894.
64	Mrs. F. E. D.	Dr. Sheffield, Masonville, N. Y.	27 M	Pyosalpinx.	Jan. 2, 1892.	Uterine appendages. Tubes large and filled with pus. Drainage.	R	Excellent recovery.
65	Mrs. D. B.	Dr. Edwards, Gloversville, N. Y.	30 M	Unilocular ovarian cyst, possibly tubercular peritonitis.	Jan. 26, 1892.	Right tube and ovary. Tubercular peritonitis. Drainage.	R	Good recovery.
66	Mrs. M. K.	Dr. Simons, Canajoharie, N. Y.	27 M	Unilocular ovarian cyst.	Feb. 2, 1892.	Right tube and ovary. Also right ovary. Dermoid. Drainage.	R	Broad pedicle. Immediate hæmorrhage from retraction vessels before abdominal incision closed. Vessels tied separately. At end 48 hours, from condition, pulse and symptoms, possible internal hæmorrhage. Wound re-opened. Only 1 oz. blood in pelvic cavity. Drainage. Death 6th day from exhaustion.

(To be continued.)

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HOWARD VAN RENSSELAER, PH. B., M. D., EDITOR.

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NO. 10.

ANNOTATIONS.

NOTICE.—An Army Medical Board will be in session at Washington City, D. C., during October, 1895, for the examination of candidates for appointment to the medical corps of the United States Army, to fill existing vacancies.

Persons desiring to present themselves for examination by the board will make application to the Secretary of War, before October 8th, for the necessary invitation, giving the date and place of birth, the place and state of permanent residence, the fact of American citizenship, the name of the medical college from which they were graduated, and a record of service in hospital, if any, from the authorities thereof. The application should be accompanied by certificates based on personal acquaintance, from at least two reputable persons, as to his citizenship, character, and habits. The candidate must be between 22 and 29 years of age, and a graduate from a Regular Medical College, as evidence of which his diploma must be submitted to the board.

Further information regarding the examination may be obtained by addressing the Surgeon General U. S. Army, Washington, D. C.

GEO. M. STERNBERG,

Surgeon General U. S. Army.

The Dangers of Antitoxin.—What seems to us the strongest argument yet brought against the employment of antitoxin as a specific for diphtheria, is conveyed as follows in a recent communication to the *Medical Journal*, by Dr. Samuel Treat Armstrong:

Those that heard Dr. Winters' very comprehensive criticism of the value of antitoxin serum in diphtheria, at the meeting of the Academy of Medicine on the 4th instant, can not but feel that an important factor has been overlooked in the consideration of the treatment with this substance; and that factor is the globulicidal power of alien serum on the blood of an animal into which it is injected.

In a monograph on transfusion of the blood, published in 1875, L. Landois reported that the serum of the dog, the horse or the rabbit, dissolved the red globules of other animals with great rapidity. And in the last edition of Professor Stirling's translation of Landois's physiology, there is the statement that, if the serum of one animal is transfused into an animal of another species, the blood corpuscles of the recipient are dissolved, and if there is a general dissolution of the corpuscles death may occur.

Dr. G. Dareberg (arch. de Med. Exp., 1892) stated that his experiments showed that, while the serum of an animal of one species did not destroy the red corpuscles of an animal of the same species, it rapidly destroyed the corpuscles of an animal of another species. If warmed to from 122° to 140° F. or exposed to the light for several days, the serum lost this globulicidal power.

G. Haymen, in his monograph on the blood, states that the serum of the ox more or less profoundly changes the blood of the dog, producing in it small emboli that may involve the functions of organs or even life itself. Microscopically; these emboli consist of degenerated elements of the blood, the hemotoblasts and the red and white corpuscles being altered by the serum. He especially states that horses' serum produces phenomena similar to those caused by ox's serum. He further states the urine is habitually suppressed and the kidneys are congested.

The tendency of alien serum to produce emboli has also been noted by C. Lazet (*La France Med.*, 1891), who found that if the serum of a dog was mixed with the blood of a man, or vice versa, there were produced more or less pronounced alterations, and solid concretions were formed from the metamorphosed elements.

The author believes that it was this tendency of alien serum to form emboli, that caused the death of the seventeen year old girl in Brooklyn, and this toxic influence of serum per se explains all the unusual and untoward phenomena that have been reported in diphtheria patients treated by antitoxin serum. The post-mortem lesions found in the five year old child whose clinical history is reported in the British Medical history for March 30th, correspond throughout with those observed by Haymen in dogs that died from the effects of alien serum injections, though the animals were given forty times as much serum as the human being.

Empiricism that has bacteriology as its sole foundation is as condemnable as any other form of that cult, and as prognosis is not yet a lost art, it seems absurd that the medical profession should accept the dictum that all persons whose nasal or faucial secretions contain the Klebs-Loeffler bacilli, should be injected with antitoxin serum. There are many recorded instances in which the bacilli have been found in the secretions of healthy individuals, and there are some recorded instances in which these bacilli have not been found in patients who clinically presented the phenomena of the disease, even to the secondary paralysis.

While antitoxin serum probably has a field of usefulness, it is evident that nice discrimination is necessary to designate wherein it lies.—*Medical Times*.

A Physical Sign of Adherent Pericardium.—In view of the fact that adherent pericardium often has an untoward influence upon the course of valvular diseases, any sign by which the condition can be recognized is worthy of serious attention. In the *Lancet* of July 27, 1895, Dr. Walter Broadbent calls attention to one which he has observed in four

cases under treatment at the Brompton hospital for consumptives. One of the cases was of aortic disease of rheumatic origin, and the others of mitral insufficiency with stenosis. In three cases there was abundant evidence of adhesion of the pericardium to the chest wall as well as to the diaphragm, but in one the heart moved freely under the ribs and the lung expanded well over it. The sign consisted in a visible retraction, synchronous with the cardiac systole, of the left side of the back in the region of the eleventh and twelfth ribs, and in three of the cases there was also systolic retraction of less degree in the same region on the right side. In all the cases there was a definite history of pericarditis, and in three of them there were other conditions strongly suggesting an adherent pericardium. "The only means of causing this retraction on both sides," Dr. Broadbent says, "would seem to be the diaphragm, which if pulled upon would have more effect on the floating eleventh and twelfth ribs than on the other more fixed ones. In cases of large heart with adherent pericardium there is a considerable area of the ventricles closely adherent to the central tendon of the diaphragm, and the powerful contraction of the hypertrophied heart must give a decided tug to the structure." That the retraction should be observed more often on the left side than on the right is only what might naturally be expected from the fact that the adhesions are chiefly to the left of the middle line; the liver also, which is often large in these cases, may, the writer thinks, restrain the movement on the right.—*Medical Record*.

Alcohol by Synthesis.—Chemists have known that ethylic alcohol can be made artificially, and with such exactness that it can not be detected from alcohol by natural processes. The alcohols of commerce are governed by a breaking down process, from a complex to a simple, by transforming starch or sugar through the aid of yeast and fermentation. Building up alcohol synthetically from carbon, hydrogen and oxygen is a new phase that promises great revolutions in many directions of science and art.

The recent discovery of Mr. Wilson, of acetylene gas from lime and coal dust treated with electricity from carbon electrodes, has made it possible to produce ethyl alcohol so cheap that all other processes will be abandoned. Organic chemistry has been leading in many fields of commerce and the question of building up products in demand, cheaper than they can be made by natural processes, is answered affirmatively by the constantly increasing substances on the market. Fruit flavors, colors, and sugars, and many other products are made far cheaper and of equal value to the same substances as produced by nature.

Foods of various natures are now made in the laboratory, and chemists have asserted that not far away beefsteak will be built up and furnished to the masses. The possibility of doing artificially or chemically what is now done by nature, seems to be limited only by want of sufficient knowledge and control of natural forces. Should Wilson's discovery of cheap acetylene prove to be what is expected, ethyl alcohol will be made for two or three cents a gallon or less. Its uses in the arts will be largely increased, and as a beverage it can be cheapened to an enormous extent to the consumer. The occupation of distilling will be superseded, and the manufacture of whiskey and other alcoholic beverages will change, and the great problems which center about them commercially, scientifically and socially, will have new features.

Who can predict what discoveries will follow in the combination of carbon, hydrogen, oxygen and nitrogen, and the possibility of tearing them down and putting them up again?
—*The Journal*.

Spread of Cholera.—Recent cable advices indicate that from very small beginnings in the Russian province of Volhynia, cholera has suddenly made an expanding break in several directions, notably to the south and west. Various dispatches from Cracow, Lemberg and other points show that it is spreading rapidly in Austrian Poland. Still more circumstantial stories come from Southern Russia, where the epidemic has reached the vicinity of Kief, and even, it is

rumored, in the city itself. As usual, there is much activity in the line of quarantine restrictions, and it is probable that this extension will renew interest in the recent strictures of Inspector-General Proust, of the French sanitary service, on the English indifference to quarantine, per se. Dr. Proust has declared that the refusal of Great Britain to apply the decisions of the International Conference is absolutely criminal, and that if Europe is invaded with cholera this summer, Great Britain will be to blame for it. Dr. C. W. Chancellor, U. S. Consul to Havre, says, however, that the attitude of Great Britain in ignoring quarantine and relying mainly on the sanitation to restrict cholera is having its effect on international cholera policy; and again points out, as the late Dr. Rauch was wont to do, that "cholera quarantine, if ever it could be satisfactorily carried out, would be of no use excepting with the regard to the one disease, cholera. Sanitation, on the other hand, is, in its measure, useful in preventing other infectious diseases, conveyable by similar means, such as typhoid fever, yellow fever, etc., and is useful also in raising the general average of health in every community." This is the lesson of the situation for the United States. If cholera should spread throughout Europe this year we may not be able to shut it out from our shores by quarantine, but we can and should make our environment so cleanly and wholesome as that it shall be fatal to cholera as well as to all other of the filth diseases.—*The Journal*.

REVIEWS AND BOOK NOTICES.

"Keil's Medical, Pharmaceutical and Dental Directory."
—George Keil, 1715 Willington street, Philadelphia, announces the early publication (fourth edition) of the "Medical, Pharmaceutical and Dental Register-Directory and Intelligencer," for the States of Pennsylvania, New York, New Jersey, Maryland, Delaware and the District of Columbia. It will present not only a complete list of all medical and dental practitioners in the States named, with

place and date of graduation, but also lists of professional educational institutions, hospitals, asylums, etc., etc., and will be of much practical value to all members of these professions.

The Principles of Surgery and Surgical Pathology—General Rules Governing Operations and the Application of Dressings.—By Dr. Herman Tillmans, Professor in the University of Leipzig. Translated from the Third Edition by John Rogers, M. D., New York, and Benjamin Tilton, M.D., New York.

Edited by Lewis A. Stemson, M. D., professor of surgery in the university in the city of New York, medical department. With 441 illustrations. New York, D. Appleton and Company. 1894.

The progress that surgical pathology has made within the past few years has been very great, as it embraces all the discoveries and improvements in each of the various specialties of surgery art and science. Heretofore the new facts and methods which have been recently evolved can be found treated to only under the individual disease or class of lesions in the special field in which the advance has been made.

Believing that there is a demand for a work which will bring all these insolated facts together, group and compare them, and treat in a general way of the principles of surgical pathology and the general rules governing the applications of dressings, this work has been written.

The book is a translation of the work of Professor Tillman, of Leipzig. With customary German thoroughness the author has prepared his topics in a systematic and painstaking manner and has taken the greatest care in collecting the latest and most valuable information of everything that bears on his topic. The book is profusely illustrated with 441 wood cuts.

The translators have also done their part thoroughly and well, making the book worthy of the confidence of English speaking physicians.

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\$1.00 A YEAR.

Diseases of the Kidneys in Pregnancy.*

BY JAMES P. BOYD, M. D.

Long ago Carl Braun of Vienna described with minuteness the state of the kidneys in women who have died of puerperal convulsions. He described the organs as being in one of three conditions.

The first condition is that of extreme congestion. The superficial vessels are dilated and full of dark blood, the cortical substance is brownish red, soft and friable; from the surface of a section there flows sticky bloody fluid with which the parenchyma is infiltrated. The cones are hyperæmic and also the mucous membrane of the pelves. Hemorrhagic effusions are sometimes seen.

In the second stage the congestion has given place to a general dull yellow color. The kidneys are larger than natural. "The surface is sometimes smooth, sometimes granulated, covered with elevations of the size of a poppy seed." There is more or less fatty degeneration of the epithelium on the malpighian bodies.

In the third stage the kidneys are reduced to their normal dimensions or even sink below them. The capsule is thickened and adherent, the surface of the kidney is uneven, tuberculated, and often shows deep furrow-like indentations dividing it into lobes. The cortical substance has wasted and the organ is generally tough in texture. The last more advanced stage being less frequent than the other two.

* Read at a meeting of Albany County Medical Society, April 24, 1895.

Lusk informs us that the most constant anatomical lesions found in post-mortem examinations of puerperal women are hyperæmia, more often an anæmic state, fatty degeneration and atrophy of the kidneys. In many cases the renal changes are of moderate extent. Löhlein in thirty-two examinations found in eight dilatation of one or both ureters and of the pelves of the kidneys.

Delafield, writing on puerperal eclampsia, has said that in the fatal cases it has been found that some of the kidneys show dilatation of their pelves and ureters, some are in the condition of acute degeneration, some are examples of acute exudative nephritis, some of acute productive nephritis, while in some the kidneys appear to be normal.

Leyden has shown from a study of the kidneys of women who died from eclampsia that the changes in these organs are not characteristic of venous stasis, but a simple fatty degeneration of the epithelium, and lastly, Norris describes the kidney of pregnancy as anæmic with fatty infiltration of the epithelial cells, and without any acute or chronic inflammation. If the pathology of the kidney of pregnancy has caused controversy, what shall be said of the etiology?

In 1842 Lever drew attention to the relations between albuminuria and puerperal convulsions. In 1851 Frerichs clearly pointed out the close resemblance between the convulsions occurring in pregnancy and the uræmic convulsions of Bright's disease. In 1857 Carl Braun, in his excellent treatise on obstetrics, presented the new doctrine with skill and clearness and brought to it effective support.

Among the earliest opponents of the uræmic theory was Seyfert of Prague. The facts which he insisted invalidated the claims of Braun and Frerichs were:

1. That convulsions may occur without albuminuria.
2. That the albuminuria is in many cases the effect and not the cause of the convulsions.
3. That in many fatal cases the kidney lesions were absent or wholly insignificant.
4. That convulsions are rare in chronic Bright's disease which had existed prior to pregnancy.

5. That in true uraemia, such as necessarily is produced by the suppression of urine when in uterine cancer, the ureters are invaded, convulsions do not occur.

Seyfert reported over seventy cases where women suffering from Bright's disease became pregnant; only two of these had convulsions.

Prof. Bamberger reports from autopsies of the "Allgemeinen Krankenhaus" in twelve years 2,430 cases of Bright's disease of which 152 were found in puerperal and pregnant women, viz.— eighty acute cases, fifty-six chronic cases and sixteen cases of atrophy. Puerperal eclampsia was recorded in twenty-three instances. According to Lusk the objection drawn from the insignificance of the kidney changes frequently observed in post mortem examinations, loses most of its force when we remember that in a large proportion of cases the retention of excrementitious materials is due to *acute suppression*.

In 104 cases of eclampsia reported by Hofmeier the kidney symptoms developed *suddenly*. This sudden suspension of the urinary secretion, Spiegelberg argues can *only* result from disturbances in the renal circulation.

A rapidly developed affection of the vessels would leave no marked post mortem traces and would in case of recovery disappear as quickly as it had come. Were the kidney troubles due principally, as was formerly supposed, to pressure of the gravid uterus upon the renal veins, the kidneys should, in post mortem examinations, exhibit evidences of congestion, on the contrary they are usually found to be pale and anæmic,

Cornil and Ranvier state that in a very large proportion of women who had died from uterine cancer the ureters were found occluded with dilatation and in some cases with hydro-nephrosis. Although the attention of Charcot and Cornil were fixed upon this point, the convulsions and coma of uraemia were *not* observed by either of those men.

In this connection Halbertsma's hypothesis is of interest; it relates to the pressure of the gravid uterus upon the ureters.

The Traube-Rosenstein theory maintained that eclampsia took place when in persons rendered hydramic by loss of albumin, the aortic pressure was suddenly increased, the increased pressure giving rise to œdema of the brain, then to secondary compression of the vessels and finally to acute anæmia.

An anæmic condition of the hemispheres would, it was predicted, produce coma, while convulsions would ensue if the condition extended to the motor centres.

Admitting toxæmic origin of eclampsia the question arises, what is the toxic substance? First urea was proposed then Frerichs suggested that decomposition of urea, resulting in formation of carbonate of ammonia was to be considered. Chemists have disputed the possibility of this transformation in the blood. According to another theory not one element but the various extractive matters creatin, creatinin etc., which with urea are retained in the blood; hence the term urinæmic.

Cases have been observed in which icterus, enlargement of the liver and general symptoms of ptomain poisoning were found, indicating that failure in those functions of the liver which have to do with the production of the blood was present. It must be remembered that the kidneys are not the only organs whose failure to perform elimination properly, produce eclampsia. The physician must not expect to find urine loaded with albumin and casts in all cases of eclampsia.

Many of the fatal cases have but a small percentage of albumin and few casts in the urine. I agree with Davis that in fact cases in which the urine is loaded with casts and albumin not infrequently recover from eclampsia, while others whose urine was almost free from albumin and casts, die with very little remission in the violence of their symptoms.

The Cause and Prevention of the Senile Cataract.

BY DR. L. F. ADT, TROY, N. Y.

In discussing so important and inexhaustive a subject as that of cataract, I shall not be unmindful of the necessarily limited space at my disposal, and therefore shall restrict myself to the essentials of that part of the subject which I am about to present.

In my remarks I shall speak in as brief a manner as possible, of the cause and prevention of the simple uncomplicated senile cataract. The congenital secondary and traumatic together with those due to constitutional troubles are to be excluded.

That form of change in the crystalline lense which we are about to discuss, develops and becomes mature principally in old age and for this reason only should it be designated as a senile cataract.

In later years the erroneous idea has become prevalent that the senile cataract, as the name implies, is simply a product of senility. This is certainly a false impression—the cataract is not a physiological product, but a diseased condition of the lense and capsule and apparently induced by over-taxed accommodation. The literature on the etiology of the simple cataract is so copious that my limited time will not permit me to discuss the subject and shall therefore simply point out some of the better known and more plausible theories. Some have likened the cataract to the turning gray of the hair and considered it physiological. Walther and others attributed the cause to an inflammation of the lense and capsule induced by various causes. From the well known theory of Walther, we passed on to the chemical endosmosis theory of Becker who considered the first disturbance due to a nuclear sclerosis and senile contraction. Deuchmann attempted to point out the existence of an albuminuria in the majority of cases, while Michel claimed to find an atheromatous degeneration of the carotids associ-

ated with the lenticular changes. To these theories a host of others could be added, some of which still have their supporters and many others which have long become obsolete. For this discussion I shall accept the recent accommodative theory of Schoen and attempt to point out as clearly and briefly as possible the cause and prevention of the senile cataract.

Inasmuch as the cause of cataract is to be attributed to accommodative strain it would be well for us to first consider briefly the mechanism of accommodation. The crystalline lense is a soft elastic body inclosed in a capsule and attached by the suspensory ligament to the ciliary body. The ciliary body is supplied with muscular fibres which have a fixed insertion at the corneo-scleral junction; when these muscular fibres contract, the attachments of the suspensory ligament are brought nearer together, allowing the elastic lense to relax, bulge forward and become more convex. The suspensory ligament is not a single band, having a single insertion at the equator of the lense, but is composed of several strands which in accommodating, have different functions. On a transverse section we find the ligament has three insertions; the middle fibres are attached at the equator, the anterior and posterior ones about one m.m. from the same. When the eye is accommodating, the suspensory ligament is not relaxed, as formerly supposed, but on the contrary the tension becomes increased owing to the increase of interocular pressure caused by the contraction of the ciliary muscle. From what has been said, it will be seen that it is through the agency of the suspensory ligament that the crystalline lense is permitted to change its form in the act of accommodation; and further, that the strain on these insertions is increased while the eye is accommodating. In studying the first cataractous changes we will find they have their seat at the point where the suspensory ligament is attached to the lenticular capsule. The ciliary muscle by which the accommodation is affected is attached in front as we have seen, to the corneo-scleral junction. From here, as has

recently been pointed out, the fibres surround the bulbus and have their insertion in the sheath of the optic nerve. It is this posterior attachment of the ciliary muscle that produces some of the early changes to be seen at the optic disc, resulting from over-taxed accommodation. The diagnostic value of these changes must not be undervalued, and will be described later on. Uncorrected hypermetropia, presbyopia and hypermetropic astigmatism are all conditions which call for an increase in accommodation.

In all these refractive anomalies the rays of light are brought to a focus behind the retina. In order to bring these rays forward and thus produce a sharp image, an increase in convexity of the lense is necessary, which is produced by the contraction of the ciliary muscle as above described. It is only as the age advances and the crystalline lense becomes flatter and the elasticity diminishes, that the greatest muscular contraction is called for. The same innervation impulse is not responded to by the accommodation as formerly. The cause does not lie in the decrease in the muscular strength, but in the diminution of the elasticity of the lense. It would be remarkable, if, as has been supposed, that the ciliary muscle alone should show senile weakness, while the other muscles of the body retain their normal strength. It is evident that the greatest muscular power is brought into play as the age advances, the tearing and pulling on the ligaments is increased, but the result to be accomplished is diminished.

It is therefore perfectly natural that the graver consequences of over-taxed accommodation should appear in the later years of life. Other causes of strained accommodation are cloudiness of the corneo, poor illumination and very fine work. These conditions cause an indistinctness of the picture on the retina. In order to make up for this imperfection the object will be brought closer to the eye so that a larger image may be obtained; hence an increase in accommodation. Aside from these causes, we find some people working at a very close range when there is no appa-

rent cause for it, other than mere force of habit. Insufficiency of the internal recti muscle is one of the most energetic causes of over-taxed accommodation. The innervation impulse to focus on an object is equally divided between convergence and accommodation.

If the muscles be weak, this innervation impulse must be increased to converge on a given object. Although the ciliary muscle be normal, it is subject to the same increased impulse and thus resulting in an over-taxation of accommodation. Use of too strong convex glasses is a very common cause of strained accommodation and is generally due to the over-correction of myopia. The myopia has been converted into hypermetropia. It is pitiful to see how many of these cases exist. I have seen many cases when patients were wearing concave glasses where convex should have been worn. The glasses only increased the trouble they were supposed to correct.

SYMPTOMS OF ACCOMMODATIVE STRAIN.

The symptoms of accommodative strain are the result of excessive working of the ciliary muscle. Among the ocular symptoms are blurred and indistinct vision while attempt to do close work, imperfect power of working at close range, a sensation of heaviness which may pass into real pain, invading the eyes and forehead, blephasospasmus and local congestion of the conjunctiva and margin of the lids. The most prominent of the general symptoms is headache, which may be situated at any part of the cranium. The pain may come on at any time. It is generally aggravated by using the eyes. Various nervous symptoms reflex in their nature as well as disturbances in the visual function are the result of strained accommodation. That some of the graver nervous disturbances can be traced to accommodative strain is not to be disputed, although there is but little doubt but what these cases have been exaggerated, especially by those who attribute the cause of chorea, epilepsy, melancholia, night terrors and a host of other nervous complaints to accommodative strain.

In connection with the symptoms thus far mentioned with which we have long been familiar, the fundus presents certain marked changes which through clinical and pathological study have been found to be the result of strained accommodation. Too much stress can not be laid upon the diagnostic value of their symptoms.

We have already learned that the tendons of the meridional fibres of the ciliary muscle have their posterior insertion at the sheath of the optic nerve. Here we find changes due to accommodative strain in the form of a cupping of the disc due to the separation of the fibres of the optic nerve, induced by the pulling and dragging of the ciliary muscle and forming the funnel-shaped excavation known as the physiological cup. A description of the physiological cup is probably uncalled for. Those who have studied the fundus of the eye are certainly quite familiar with its appearance. That the so-called physiological cup is not congenital has been conclusively pointed out, and in time the accommodative strain will probably be universally accepted as the cause.

Another change in the fundus having a cause in common with the one just mentioned is a reddish-yellow ring surrounding the optic disc, which is to be known as the halo.

On the nasal side it is limited by a sharp margin, while the temporal side is blurred and indistinct.

It is due to the scleral ring widening out into a semi-atrophic area of disturbed choroid, and permitting the deeper structures to show through. This must not be confused with the cases of atrophy of the choroid seen in myopic eyes.

We may also mention here the congestion of the disc and choroid which is so often associated with strained accommodation.

The disc acquires a dull red or brick-dust hue which shades with a blurred margin into the red color of the fundus, while the choroid, owing to its color, presents no marked change.

These symptoms are at times the only indication of strained accommodation to be seen on the fundus, and are therefore of marked diagnostic value.

Lastly, we may add reversed astigmatism as a symptom of long continued accommodative strain. We know that astigmatism is divided into regular and reversed.

Regular, when the greater refractive power is in the vertical meridian, and reversed, when the greater refractive power is reversed so that it lies in the horizontal meridian. By some, these two kinds are known as astigmatism with and against the rule.

Statistically, we have found that reversed astigmatism is to be found in the young astigmatic eye in but one-tenth of the cases, while in those of 60 years, in about two-thirds.

From this it is self-evident that the regular astigmatism in course of time becomes converted into the reversed.

Clinically, we can trace the cause of this transformation to accommodative strain. Hence, while regular astigmatism is to be considered one of the causes of accommodative strain, reversed astigmatism is to be looked upon as one of its products.

Most of the pathological conditions resulting from strained accommodation have been considered, but it still remains for us to speak of the changes found in the crystalline lense, namely, the cataract.

To study the cataractous change on the lining it will be found necessary that the pupil be dilated.

The first changes are small delicate stripes and spots ranging from a steel gray to a grayish white and are to be seen under the capsule at the insertion of the anterior and middle fibres of the suspensory ligament, and as a rule are found in the horizontal meridian. The transmitted light will not reveal these slight changes—it is only by oblique or focal illumination that they are to be seen and even then are only detected by an experienced observer. Later, the more deeply-seated changes may be seen with the transmitted light and not until then is the senile cataract generally detected, the previous, more delicate changes having been overlooked.

I regret that my limited time will not allow me to describe the various lentilocular changes up to the time of maturity.

The senile cataract is to be considered a chronic, and at times, an acute inflammation of the capsular epithelium induced by the tugging and tearing of the suspensory ligament, causing a detachment of the capsule in small folds, a proliferation of the capsular epithelium in a seam behind the equator corresponding to the middle attachment of the suspensory ligament, and another seam in front of the equator corresponding to the attachment of the anterior fibre of the suspensory ligament.

The capsule becomes detached at the equator. The younger lense fibres and later the older ones become atrophic and lastly a general nutritive disturbance of the lense is added, which leads to the total cataract.

The hereditability of the senile cataract in certain families is to be found in the inherited anomaly, which causes the increase in accommodation, and like squint, is generally the outcome of some uncorrected refractive anomaly. This is certainly the simplest and most natural explanation for the transmission of the cataract.

We have now studied most of the pathological conditions resulting from strained accommodation.

Of these, the gravest by far is the cataract, the others being of value principally for diagnostic purposes.

Probably the most conclusive evidence that the cataract is a product of strained accommodation, is to be found by studying the first cataractous change.

With still normal vision we find the first changes at the outer equator of the lense appearing in such a manner as above described, that it is evident that the suspensory ligament is the prime factor in producing these pathological changes.

Aside from this, statistics show us that the cataract is to be found principally in hypermetropic or astigmatic eyes, the remainder being presbyopic.

Further, the cataract is generally associated with changes to be found on the fundus—namely, the physiological cup and halo, together with the other symptoms of strained accommodation.

As for the treatment of accommodative strain, the principal requisite is that the work be held a proper distance from the eye; that a proper glass be worn for near as well as for distant work and that the muscular insufficiency be corrected either by prisms or tenotomy.

In prescribing glasses, we should adhere to the ordinary rules, excepting in those cases where there is a low degree of reversed astigmatism present—here it will be found better to correct everything but the astigmatism.

Patients are to be especially warned not to hold their work too close and also to avoid very fine work. Those compelled to do very fine work should be aided by a convex lense and only use the one eye.

In order that the work may be held at a proper distance it is essential that the work be properly illuminated.

The wholly unnecessary fine hand work done by women is one of the most energetic causes of strained accommodation. It would be better if this work were entirely dispensed with.

Over-taxation of the eye is also brought about by reading on railroad trains, by studying languages whose text is intricate, such as Greek, German and Hebrew.

In considering the treatment and prophylaxis of this important affection, the frequency of its existence must be borne in mind. The simple cataract is not merely present in a scattered few, but is an affection to be found in a very large percentage of people—namely: in all, an average of one-fifth and in the elderly, over one-half, while in the very old, we find fully two-thirds have cataractous changes.

It is also true, indeed, that but a small percentage of these reach maturity and come to operation.

In some, the progress is checked by treatment, while the majority of cases appear so late in life that maturity is never reached.

Years before the appearance of the cataract, symptoms present themselves which are forerunners of this affection; thus allowing ample time for preventive treatment.

There are but few affections where timely and appropriate treatment may be attended with the success achieved in troubles resulting from strained accommodation.

Therefore, the earlier a correct diagnosis is reached the sooner will the existing symptoms be relieved and further danger averted.

The Legal Liability of Physicians in Certifying as to Insanity. *

BY ALDEN CHESTER.

The law of New York in relation to the care and custody of the insane provides, that "no person shall be committed to or confined as a patient in any asylum, public or private, or in any institution, home or retreat for the care and treatment of the insane, except upon the certificate of two physicians, under oath, setting forth the insanity of the person." (Ch. 446, Laws 1874.)

The statute further provides that no person shall be held in confinement in any such asylum for more than five days, unless within that time such certificate be approved by a judge of a court of record of the county or district in which the alleged lunatic resides, and such judge may institute inquiry and take proofs as to any alleged lunacy before approving or disapproving such certificate and may in his discretion call a jury in each case to determine the question of lunacy.

Provision is also made in the statute that it shall not be lawful for any physician to certify to the insanity of any person for the purpose of securing his commitment to an asylum, unless such physician be of reputable character, a graduate of some incorporated medical college, a permanent resident of the state, and shall have been in the actual practice of his profession for at least three years, such qualifications to be certified to by a judge of any court of record. It

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is required that no certificate of insanity shall be made except after a personal examination of the party alleged to be insane, and according to forms prescribed by the State Commissioner in lunacy and that every such certificate shall bear date of not more than ten days prior to such commitment.

The certificates of examiners in lunacy are required to be filed in the office of the clerk of the county of their residence and a certified copy thereof filed in the office of the State Commission in Lunacy. (Ch. 283, Laws 1889, as amended by Ch. 273, Laws 1890.)

Similar provisions of law, authorizing the temporary commitment of insane persons upon the certificate of physicians, exist in many other states.

The purpose of this paper is to discuss briefly the liability imposed by law upon physicians in making the certificate authorized by the statutes.

It will be observed that the statutes of New York, and I believe those of other states, provide a method of depriving a person of his liberty, for a brief period at least, without any judicial proceeding and without a trial by jury.

Since the days of Magna Charta it has been a principle of the law that no freeman should be taken or imprisoned but by the lawful judgment of his peers or by the law of the land.

It is provided in the Constitution of the United States that no state shall deprive any person of life, liberty or property without due process of law. The Constitution of New York provides that no member of the state shall be deprived of any of the rights or privileges secured to any citizen thereof, unless by the law of the land or the judgment of his peers; nor be deprived of life, liberty or property without due process of law.

The Court of Appeals in N. Y. holds that the phrase "the law of the land," as used in the Constitution, is not materially different in meaning from the phrase "due process of law." (People ex rel. Witherbee v. Supervisors, 70 N. Y. 234.)

The term "due process of law" has been variously defined. Judge Cooley, in his treatise on Constitutional Limitations, says (p. 356), "Due process of law means such an exercise of the powers of government as the settled maxims of law permit and sanction, and under such safeguards for the protection of individual rights as those maxims prescribe for the class of cases to which the one in question belongs."

Judge Edwards, sitting in the New York Court of Appeals, says, "Due process of law undoubtedly means, in the due course of legal proceedings, according to those rules and forms which have been established for the protection of private rights." (*Westervelt v. Gregg*, 12 N. Y. 209.)

Judge Selden, in writing the opinion of the same court in another case, says, in discussing the phrase, "It must be understood to mean that no person shall be deprived, by any form of legislation or governmental action, of either life, liberty or property, except as the consequence of some judicial proceeding appropriately and legally conducted." (*Wynehamer v. The People*, 13 N. Y. 434.)

Judge Folger, of the same court, says: "Due process of law requires that a person shall be properly brought into court, and that he shall have an opportunity when there, to prove any fact which, according to the constitution and the usages of the common law, would be a protection to him or to his property." (*People ex rel. Witherbee v. Supervisors*, 70 N. Y. 228 at 234.)

It has been held by the Supreme Court in Minnesota that a statute relating to inquisitions of lunacy which does not provide for a judicial investigation and determination of the sanity of the supposed lunatic, at which he has an opportunity to be heard, is invalid as being in conflict with those provisions of the state and federal Constitutions which forbid that any person shall be deprived of his liberty without due process of law. (*State v. Billings*, 57 N. W. [Minn.] 794, 55 Minn. 467.)

Because of these constitutional provisions, it can hardly be claimed that the confinement of a person simply upon the

certificate of two physicians that he is insane, constitutes a legal commitment. For this reason physicians who have made these certificates have been repeatedly subjected to prosecutions in the courts, in actions for false imprisonment, on the theory that the statute authorizing commitments without a trial, under these certificates as to insanity, are unconstitutional and void.

Dr. Ordronaux in his well known work on Insanity says, (p. 69) "The arrest, as a matter of public right, of an alleged lunatic, dangerous to himself and others, and his removal to an asylum upon the certificate of two physicians, pending judicial approval of the same, is not in itself a legal commitment. Nor was it intended to be by the revisers of the statute. But the frequent necessity of summary arrest and restraint of the person in cases of lunacy being everywhere recognized, the duty of securing some provisional means of protection to society as well as to the alleged lunatic, gives color of right to such summary procedure *ab initio*. Accordingly the five days' detention is allowed as a measure of physical safety to the patient, and a safeguard to the public. It is in the nature, therefore, only of a preliminary inquisition into a statement of facts not yet judicially verified. This provisional commitment to an asylum is complete as to the right to *receive* into custody, but inchoate as to the right to *detain*. In order to render the commitment complete the statute requires the approval of a judge of a court of record. This judicial verification of the legality of the arrest and commitment to an asylum constitutes a warrant of commitment and may consequently be pleaded in bar to an action for false imprisonment."

While it must be conceded that the power given by the statute of New York to deprive a person of his liberty for five days, without a trial by jury and without any judicial process, is not in harmony with the common law as it has come down to us in the constitutional provisions above referred to, yet the cases clearly recognize that with reference to the subject under discussion there is a law higher than the common law, viz.: "The great law of humanity."

Chief Justice Shaw (Oake's case, 8 Law Rep. 122) says: "The right to restrain an insane person of his liberty is found in that great law of humanity which makes it necessary to confine those whose going at large would be dangerous to themselves or others. The necessity which creates the law, creates the limitation of the law."

Dr. Ordronaux says (Insanity, p. 65), "The common law, which ever recognizes the right of personal liberty as among the most inalienable of all civil rights, permits no restraints to be placed upon it, except such as may be necessary for the protection of the community. *Salus populi snprema lex*. But inasmuch as the insane are themselves a portion of the community, it follows that society is as much bound to protect them against their own acts as it is to protect itself against these same persons. * * * The proper test in all cases is the dangerous nature of the disease, not the dangerous character of the demeanor alone." (Id. p. 67.)

The right to interfere with a person's liberty without a trial by jury and without the judgment of his peers, is often exercised in analagous cases.

When a person is infected with a contagious disease, or in some cases where he has simply been exposed to it, no one questions the right of the municipality to confine or quarantine him in order to prevent the spreading of the disease and protect others from contact with it. There need be no trial by jury nor any judicial proceeding unless the order of a board of health be regarded as such proceeding. The police power of the state in this case is supreme and adequate.

It also often happens that a person is arrested, charged with a criminal offense, who is unable to furnish bail. He is examined before a magistrate and committed to await the action of the grand jury. If indicted he is imprisoned until trial. At trial he may be found to be innocent of the charge. Yet no action will lie for a false imprisonment against the person who swore out the warrant for his arrest, unless the prosecution was malicious and without probable cause. It never has been suggested that a person so committed was

imprisoned without due process of law or the judgment of his peers.

No sufficient reason can be shown why there should be any greater cause for complaint by a person deprived of his liberty by the honest but mistaken certificate of two physicians that he is insane than by a man quarantined to prevent the spread of a contagious disease, or by an innocent man imprisoned on a criminal charge honestly made by one having probable cause to believe him guilty.

The adjudicated cases upon the question directly involved in this paper are not numerous. It has been held that an action would lie against the physician for maliciously and without any reasonable or probable cause signing a certificate that a party was insane and in a state requiring to be confined, in consequence whereof a party had been detained in custody as a lunatic. (Shelford on Lunatics, p. 518, 2d ed.)

It has also been held that such a certificate maliciously and falsely made, is a libel, and that an indictment would lie against the person signing it. (Perkins v. Mitchell, 31 Barb. 461.)

But where such certificate is honestly made, after proper examination and with the exercise of a reasonable degree of care and skill, no reason is apparent why any other or different liability should exist for a mistake of judgment than for a mistake made under like circumstances in any other professional employment.

The general rule of law is that every person who enters a learned profession, undertakes to bring to the exercise of it a reasonable degree of care and skill and is liable only for the injury resulting from a failure to exercise the same. (Bellinger v. Cragne, 31 Barb. 534; Beckwith v. Oatman, 43 Hun 265; Carpenter v. Blake, 10 Hun 358, same case affirmed, 75 N. Y. 12.)

Physicians and surgeons, by holding themselves out as such, impliedly contract that they possess the reasonable and ordinary qualifications of their profession, and are under a duty to exercise reasonable and ordinary care, skill and

diligence, but that is the extent of their liability. (Am. and Eng. Enc. of Law—Article “Malpractice,” and cases cited, vol. 14, p. 76.)

The burden of proof is always on the plaintiff to show that there was a want of due care, skill and diligence, and the reasonable and ordinary care, skill and diligence which the law requires of physicians and surgeons is such as the profession in the same neighborhood in the same general line of practice, ordinarily have and exercise in like cases. (Id. p. 78.)

This general rule of law, applicable in all cases of alleged malpractice, has recently been applied by the courts in Pennsylvania, Maine and New York to cases of physicians' certificates as to insanity.

In a Pennsylvania court it was held that a physician who signs a certificate of insanity when the patient is sane is not liable therefor when the certificate was signed after making an examination and was erroneously made because of an error in judgment; that no presumption of negligence arose from the mere fact that the physician was mistaken, and that the burden of proof was on the plaintiff to show negligence. (Williams v. La Bar, 21 Atlantic Rep. [Pa.] 525.)

In Maine it was held that physicians can not be made liable for the insufficiency of methods pursued in reaching their conclusion as to insanity, but only for their falsehood; and defendants may show precisely the circumstances under which they acted, and such evidence is admissible in mitigation of damages, even if it fail to justify their action. (Pennell v. Cummings, 75 Maine 163.)

In the New York Supreme Court at General Term in Third Department it was held that physicians, in making a statutory examination of a person alleged to be insane with a view to his confinement, do not act in a judicial capacity and are liable for a lack of proper and ordinary care and prudence in making their examination. (Ayers v. Russell and others, 50 Hun 282.)

The Ayers case—the one last cited—was one of local importance, as it involved two members of the Albany County Medical Society. If a further statement was not made concerning it, it might be inferred that the court had decided that the physicians making the certificate in that case had been guilty of a failure to exercise proper care and prudence, by reason of which failure they had made a false certificate. This is not so. The decision of the court was made upon a demurrer to the complaint in which the plaintiff alleged that the physicians had made the certificate, “without proper and ordinary care and prudence, and without due examination, inquiry and proof into the fact whether plaintiff was sane or insane.” For the purposes of the demurrer only, this allegation had to be taken as true. Admitting for the sake of the argument of the demurrer that this allegation was true, the court held that the physicians were liable, and overruled the demurrer, but permitted them to withdraw it and file an answer. An answer was then interposed denying the allegation and a trial had which resulted in a verdict for the defendants.

The most careful and skillful of physicians is liable to an error of judgment in forming an opinion with reference to a subtle and mysterious disease like insanity, and in actions for damages for injuries following or caused by an honest mistake of judgment in cases of this kind the courts are and ever should be ready to furnish complete immunity.

It is proper to observe that the right to make certificates of lunacy, whereby any citizen may temporarily be deprived of his liberty, is a grant of power of a very responsible character. The physician who exercises it under the law should not be influenced on the one hand by the importunities of friends or interested parties who may desire to rid themselves of a troublesome member of their household, or on the other by the protestations of sanity so often made by those affected with mental diseases.

Even when free from all outside influences and prompted solely by an effort to properly discharge the responsibilities

imposed by law, the task of the physician in many cases is extremely delicate and difficult. Insanity assumes such varied forms and produces such opposite effects as frequently to baffle the ripest professional skill. This being so it is not strange that it sometimes happens that a jury disagrees with a professional opinion as to insanity.

But as was said by Judge Landon, in writing the opinion of the court in the Ayers case, "So long as physicians do their duty with the care and skill the statute presumes and requires, they are not responsible to the plaintiff for the consequences, however harsh they may be, for in such a case the law affects the plaintiff, but when they do not use such care and skill, it is their personal negligence which affects him," and the physician is liable for the damages which follow.

It will be seen from what has been said that the legal rule as to the liability of physicians in making examinations and signing certificates as to insanity does not in any respect differ from the rule of law in cases of alleged malpractice. In either case, negligence and lack of skill must be alleged and proven and where there is no negligence and ordinary skill has been exercised there is no liability.

Report of One Hundred and Forty-Five Operations Done for the Removal of Ovarian Tumors and Pathological Conditions Associated with the Ovaries and Uterine Appendages Only.

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CONTINUED FROM PAGE 313.

An abstract of this paper was read at the meeting of the American Association of Obstetricians and Gynecologists, Toronto, Canada, September 19th, 1894.

No.	NAME.	PHYSICIAN AND RESIDENCE.	AGE, CIVIL CON.	DIAGNOSIS OF DISEASE.	DATE OF OPERATION.	NATURE OF OPERATION. REMOVAL.	RESULT.	REMARKS.
67	Mrs. I. H.	Dr. Infield, Sandy Hill, N. Y.	59 M	Multilocular ovarian cyst.	Feb. 12, 1892.	Cyst, right ovary. Slight adhesions.	R	Good recovery. In excellent health, May, 1894.
68	Mrs. M. A. D.	Dr. Still, Johnstown, N. Y.	25 M	Salpingitis. Hysteropilepsy.	March 5, 1892.	Uterine appendages.	R	Menstruated nearly every month since operation. Better for some time of epileptic seizures, but September, 1894, quite as bad as ever.
69	Mrs. F. S.	Dr. Gray, Greenwich, N. Y.	35 M	Tubercular peritonitis.	March 9, 1892.	Uterine appendages. Drainage.	R	Patient in excellent health, May, 1894.
70	Miss B. C.	Dr. Holdridge, Niskayuna, N. Y.	16 S	Tubercular peritonitis.	April 8, 1892.	Uterine appendages. Drainage.	R	Patient died 3 months after operation, from all symptoms general tuberculosis.
71	Mrs. A. B.	Dr. Millbank, Greenbush, N. Y.	32 M	Tubercular peritonitis.	May 2, 1892.	Incision, cocaine. Ovaries studied with tubercles; also peritonium. Drainage.	R	Patient in excellent health, May, 1894.
72	Mrs. A. H.	Dr. Nichols, Sand Lake, N. Y.	28 M	Ovarian cyst, peritonitis.	May 26, 1892.	Cyst, right ovary; numerous adhesions. Ligated; drainage.	R	Good recovery. Patient in good health one year after operation.
73	Mrs. L. G.	Dr. Papen, Albany, N. Y.	42 M	Multilocular ovarian cyst.	May 29, 1892.	Cyst of right ovary and tube; many adhesions. Left tube and ovary removed. Drainage 2d day.	R	Suffered from diabetes for 2 years. At time of operation passed urine containing 9 grains sugar to oz. Died comatose 3d day.
74	Mrs. I. L.	Dr. Haynes, Cohoes, N. Y.	35 M	Unilocular ovarian cyst.	June 15, 1892.	Cyst, left side; right ovary healthy. 2 gals. fluid. Drainage.	R	Excellent recovery and in good health, June, 1894.
75	Mrs. M. D.	Dr. Hannan,	48 M	Ovarian cyst,	Aug. 30, 1892.	Diagnosis confirmed.	R	Uninterrupted recovery.
76	Mrs. L. C. B.	Dr. Wilson, Schodack, N. Y.	71 M	Multilocular ovarian cyst.	Sep. 30, 1892.	Cyst, right ovary. Left ovary not disturbed. Some adhesions. 8 quarts fluid. Drainage.	R	Good recovery. Patient alive, June, 1894.
77	Mrs. H. G.	Dr. Geel, Berlin, N. Y.	40 W	Double pyosalpinx, specific.	Oct. 10, 1892.	Uterine appendages. Very tedious operation; many adhesions. Drainage.	D	Death on 6th day from exhaustion.
78	Mrs. M. A. A.	Dr. Knapp, Forest City, Pa.	27 M	Double pyosalpinx and tubercular peritonitis.	Oct. 14, 1892.	Uterine appendages. Drainage.	R	Good recovery. Patient writes May, 1893, seldom had such good health as then enjoying.

79	Miss A. A.	Dr. Kellogg, Plattsburgh, N. Y.	39 S.	Double pyosalpinx, cirrhotic ovaries.	Oct. 30, 1892.	Diagnosis confirmed. Appendages.	Uterine	R	Good recovery. Much improved in health, December, 1893.
80	Miss E. W.	Dr. Scully, Rome, N. Y.	24 S	Multilocular ovarian cyst. Peritonitis.	Nov. 1, 1892.	Cyst, right ovary. Some adhesions.		D	Death on 5th day, due to intestinal obstruction.
81	Miss E. W.	Dr. Taylor, Bainbridge, N. Y.	16 S	Multilocular ovarian cyst.	Nov. 3, 1892.	Diagnosis confirmed.		R	Recovery on about 16th day.
82	Miss C. L. L.	Drs. Kniskern and Stover, Amsterdam, N. Y.	40 S	Double pyosalpinx.	Nov. 29, 1892.	Diagnosis confirmed. Uterine appendages.		R	Excellent recovery.
83	Mrs. K. O.	Dr. Johnson.	37 M	Unilocular ovarian cyst.	Dec. 1, 1892.	Diagnosis confirmed.		R	Good recovery.
84	Mrs. E. G.	Dr. Carty, North Granville, N. Y.	37 M	Ovarian cyst and pyosalpinx.	Jan. 16, 1893.	Cyst and uterine appendages.		R	Excellent recovery.
85	Miss F. W.	Dr. Lough, Edmeston, N. Y.	19 S	Unilocular cyst, right ovary.	Jan. 18, 1893.	Diagnosis confirmed. Left ovary healthy. Not disturbed.		R	Excellent recovery. In good health, Sept., 1894.
86	Mrs. M. B.	Dr. Papen, Albany, N. Y.	40 M	Multilocular ovarian cyst and suspected pregnancy.	Jan. 18, 1893.	Multilocular cyst, right ovary. Pregnancy 4 months. 27 pints fluid.		D	Patient's history very interesting. Tapped twice. Aborted 48 hours after operation. Death from exhaustion on 5th day.
87	Mrs. F. K.	Dr. Phillips, Gloversville, N. Y.	30 M	Cyst, left ovary.	Jan. 23, 1892.	Unilocular cyst, each ovary, 9 pints fluid.		R	Excellent recovery. Good health, June, 1894.
88	Mrs. A. W. K.	Dr. Gorham, Albany, N. Y.	57 M	Multilocular ovarian cyst. Recent peritonitis.	Feb. 2, 1893.	Cyst right ovary. Left ovary and tube normal. Slight adhesions. 25 pints fluid. Drainage.		R	Excellent recovery. In good health, Sept., 1894. Looks ten years younger than before operation.
89	Mrs. D. S.	Dr. Brownell, Onconota, N. Y.	34 M	Double pyosalpinx. Specific probably. Several attacks pelvic peritonitis.	Feb. 11, 1893.	Uterine appendages. Very serious adhesions.		D	Operation long and tedious. Death from exhaustion on 3d day.
90	Mrs. E. D.	Dr. Brownell, Oneonta, N. Y.	23 M	Double pyosalpinx.	Feb. 13, 1893.	Uterine appendages.		R	Good recovery, though at times suffering from pelvic pain and had some flow for few months following operation.
91	Mrs. A. W.	Dr. Hall, Adamsville, N. Y.	24 M	Left ovary diseased. Dysmenorrhoea, etc.	Feb. 16, 1893.	Uterine appendages. Left ovary, prolapsed and developing cyst. Right cirrhotic stenosis of tube.		R	Good recovery. In excellent health, June, 1894.
92	Mrs. K. W.	Dr. Magee, Lansingburgh, N. Y.	25 M	Pelvic peritonitis. Pyosalpinx double.	March 18, 1893.	Uterine appendages. Cystic degeneration of ovaries. Firm adhesions.		R	Not a rapid recovery, but ultimately improved and presents the best appearance of health. June, 1894.

NO.	NAME.	PHYSICIAN AND RESIDENCE.	AGE. CIVIL CON.	DIAGNOSIS OF DISEASE.	DATE OF OPERATION.	NATURE OF OPERATION. REMOVAL.	RESULT.	REMARKS.
93	Mrs. S.	Dr. Lincoln and Dr. Hodgman, Wilton, N. Y.	27 M	Pyosalpinx puerperal.	April 19, 1893.	Right ovary.	D	Operation following confinement 12 days previously. Septic condition. Uterus curetted twice. Chills, etc., not controlled. Death 4th day.
94	Miss J. K.	Dr. Ross, Whiting, Vt.	15 S	Tubercular peritonitis.	May 2, 1893.	Incision. Drainage.	R	Excellent recovery.
95	Mrs. P. D.	Dr. Johnson, Ashland, N. Y.	40 M	Ovarian cyst.	May 4, 1893.	Unilocular cyst, left ovary.	R	Uninterrupted recovery.
96	Mrs. E. P.	Dr. Fritts, Hudson, N. Y.	50 M	Cyst, right ovary.	May 16, 1894.	Unilocular cyst, right ovary.	R	Quick recovery. Second operation. Dr. T. G. Thomas removed cyst, left ovary, 1879
97	Mrs. I. P.	Dr. Rider, Buskirk's Bridge, N. Y.		Multilocular ovarian cyst. Peritonitis. Possible suppuration and pregnancy.	July 24, 1893.	Multilocular cyst, right ovary, Slight adhesions. 3 months pregnant.	R	Good recovery followed by normal confinement at full time. In excellent health, June, 1894.
98	Mrs. M. F.	Drs. Archambeault and Morrow, Cohoes, N. Y.	32 M	Tubercular peritonitis.	Sept. 7, 1893.	Diagnosis confirmed. Drainage.	R	Good recovery. In excellent health 6 months later.
99	Miss M. S.		38 S	Unilocular cyst, right ovary.	Sept. 8, 1893.	Diagnosis confirmed. Pyosalpinx; left tube removed with ovary.	R	Excellent recovery.
100	Mrs. E. G. D.	Dr. Pond, Rutland, Vt.	27 M	Extra uterine pregnancy, right side, right side.	Sept. 17, 1893.	Extra uterine pregnancy, right side, with tube and ovary. Pyosalpinx, left ovary and tube removed. Drainage.	R	Rapid recovery.
101	Mrs. E. W.	Dr. Stover, Albany, N. Y.	29 M	Double pyosalpinx, probably specific.	Sept. 21, 1893.	Uterine appendages.	R	Good recovery. Patient doing well, June, 1894.
102	Mrs. J. C. D.	Drs. Keegan and Hennesy, Albany, N. Y.	28 M	Extra-uterine pregnancy.	Sept. 21, 1893.	Four months foetus and placenta. Many clots, right side.	D	Death from shock in 12 hours.
103	Miss G. T.	Dr. Smith, Poultney, Vt.	18 S	Tubercular peritonitis.	Sept. 22, 1893.	Uterine appendages. Ovaries and tubes studded with tubercular masses. Tubes thickened. Drainage.	R	Excellent recovery.

104	Mrs. M. V.	Dr. Easton, Van Hornesville, N. Y.	52 W	Multilocular right ovary.	cyst,	Sept. 23, 1893.	Diagnosis confirmed. Some ad- hesions. Left ovary healthy. Not removed. 7 qts. fluid.	R	Splendid recovery.
105	Mrs. E. E.	Dr. Ullman, Albany, N. Y.	27 M	Multilocular right ovary. Peri- tonitis.	cyst, Peri- ovarian	Sept. 25, 1893.	Diagnosis confirmed. Firm ad- hesions, one spot. Left ovary normal, not disturbed. 10 qts. fluid.	R	Excellent recovery. In good health August, 1894.
106	Mrs. I. A.	Dr. Riley, Adams, N. Y.	54 M	Multilocular cyst.	ovarian cyst.	Sept. 28, 1893.	Multilocular cyst, left ovary, also right ovary and tube. 14 qts. fluid.	R	Rapid and excellent recovery.
107	Miss E.	Dr. Gray, Green- wich, N. Y.	20 S	Ovarian Pyosalpinx	abscess- double.	Oct. 4, 1893.	Uterine appendages.	R	Good recovery. Fairly encouraging result. Private hospital.
108	Mrs. M. S.	Dr. Kniskern, Amsterdam, N. Y.	27 M	Double pyosalpinx.		Oct. 7, 1893.	Uterine appendages. Tubes very much thickened and filled with pus. Drainage.	R	Good recovery. Patient obliged to go to work at once. September, 1894, presented with threatened hernia.
109	Miss M. R.	Dr. Bigelow, Albany, N. Y.	60 S	Multilocular right ovary.	cyst,	Oct. 12, 1893.	Diagnosis confirmed. No adhe- sions. Left ovary senile, not disturbed.	R	Excellent recovery.
110	Mrs. J. M.	Dr. Mead, Jerusa- lem, N. Y.	40 M	Double pyosalpinx. Abscess.		Oct. 12, 1893.	Uterine appendages.	R	Slow but gradual recovery. Patient very neurasthenic.
111	Mrs. L. de L.	Dr. Willard, Watertown, N. Y.	45 M	Diseased left ovary. Very painful. Double pyosalpinx.		Oct. 15, 1893.	Diagnosis confirmed. Uterine appendages.	R	Recovery retarded. September, 1894, relieved of all pelvic pain but still confined to bed more or less.
112	Mrs. H. M.	Dr. Rossman, Ancram, N. Y.	36 M	Double ovarian cyst and uterine fibroid.		Oct. 21, 1893.	Diagnosis confirmed. Supra- vaginal hysterectomy. Liga- tures. Drainage.	R	Excellent recovery.
113	Mrs. J. S.		36 M	Cyst, left ovary.		Oct. 21, 1893.	Large cyst, right ovary, also left ovary for cystic degeneration.	R	Good recovery.
114	Miss M. N.	Dr. Vander Veer, Troy, N. Y.	31 S	Multilocular cyst.	ovarian	Oct. 30, 1893.	Double multilocular ovarian cyst. Uterine fibroid supra- vaginal hysterectomy. Tail clamp. 5 qts. fluid.	R	Good recovery.
115	Mrs. M. C. P.	Dr. Wheeler, Chat- ham, N. Y.	23 M	Probably sarcoma, left broad ligament.		Nov. 2, 1893.	Multilocular cyst, left ovary. Right ovary cirrhotic and re- moved with tube.	R	Good recovery. In good health, June, 1894.

NO.	NAME.	PHYSICIAN AND RESIDENCE.	AGE, CIVIL CON.	DIAGNOSIS OF DISEASE.	DATE OF OPERATION.	NATURE OF OPERATION. REMOVAL.	RESULT.	REMARKS.
116	Mrs. S. H.	Dr. Niver, Hillsdale, N. Y.	36 M	Double pyosalpinx.	Nov. 2, 1893.	Diagnosis confirmed. Uterine appendages.	D	Patient did nicely. Wound healed; began to sit up on 21st day; 23d day symptoms obstruction presented. Unable to relieve and died on 27th day.
117	Mrs. R. C.	Dr. H. H. Smith, Hudson, N. Y.	46 M	Tubercular peritonitis.	Nov. 2, 1893.	Incision, drainage. Diagnosis confirmed. 12 qts. liquid.	R	Good recovery.
118	Mrs. E. McC.	Dr. Reynolds, Saratoga, N. Y.	34 M	Pelvic peritonitis. Dysmenorrhœa.	Nov. 16, 1893.	Uterine appendages, Firm adhesions.	R	Excellent recovery.
119	Miss K.	Dr. Chambers, Kingston, N. Y.	30 S	Old general and pelvic peritonitis. Dysmenorrhœa. Hysterio-epilepsy.	Nov. 29, 1893.	Right ovary and tube like intestine. Many and very firm adhesions. Left ovary and tube could not be found.	R	Good recovery. Patient very much better until May, 1894, when severe convulsive seizures, flowing coming on two months in succession at this time.
120	Mrs. H. W.	Dr. Knapp, Forest City, Pa.	28 M	Pelvic peritonitis.	Nov. 30, 1893.	Uterine appendages. Cystic degeneration ovaries. Firm adhesions.	R	Good recovery. In excellent health 8 months later.
121	Miss E. L. H.	Dr. Vander Veer, Troy, N. Y.	32 S	Unilocular ovarian cyst.	Dec. 7, 1893.	Multilocular cyst, left ovary. Right ovary for atrophy. Fluid 10 qts. Cyst 15 oz.	R	Excellent recovery.
122	Miss S.	Dr. Cook, Albany, N. Y.	28 S	Double pyosalpinx. Uterine fibroid.	Dec. 7, 1893.	Diagnosis confirmed, Uterine appendages.	R	Excellent recovery. Patient in good health. June, 1894.
123	Mrs. E. M.	Dr. Ross, Poultney, Vt.	27 M	Pelvic peritonitis. Double pyosalpinx.	Dec. 15, 1893.	Uterine appendages. Very firm adhesions.	D	Death from shock.
124	Mrs. M. S.	Dr. Van Slyke, Cossackie, N. Y.	71 M	Multilocular ovarian cyst.	Dec. 18, 1893.	Multilocular cyst, right ovary. 16 qts. fluid. Cyst 3 lbs.	D	Patient recently suffered from grippé. Death from pulmonary infarction.
125	Mrs. P. S.	Dr. Crosby, E. Nassau, N. Y.	27 M	Unilocular ovarian cyst.	Dec. 24, 1893.	Unilocular cyst, right ovary; also left ovary. Cystic enlargement.	R	Good recovery.
126	Miss H. V.	Dr. Papen, Oneonta, N. Y.	19 S	Multilocular ovarian cyst. Acute peritonitis.	Jan. 2, 1894.	Cystic papillomatous mult. cyst, left ovary. Right ovary cystic. Firm adhesions. Drainage Removal second day 11 qts. fluid.	R	Patient made good recovery. Returned in August with marked growth, left side pelvis, probably nature, true sarcoma. No further operation done.

127	Mrs. E. F. S.	Dr. Sabin, W. Troy, N. Y.	42 M	Pelvic peritonitis. Double pyosalpinx.	Feb. 22, 1894.	Uterine appendages. Many and firm adhesions. Drainage.	R	Good recovery.
128	Miss J. D.	Dr. Johnson, Amsterdam, N. Y.	26 S	Supposed disease of ovaries, causing sympathetic vomiting.	Feb. 23, 1894.	Section, ovaries and tubes. Healthy; not removed. Some adhesions loosened and tubes straightened.	R	Slow but excellent recovery.
129	Miss A. E.	Dr. Millington, Argyle, N. Y.	28 S	Pelvic peritonitis. Dysmenorrhœa.	Feb. 24, 1894.	Uterine appendages. Many adhesions.	R	Excellent recovery.
130	Miss M. D.	Drs. Stover and Kniskern, Amsterdam, N. Y.	22 S	Pelvic peritonitis and enlarged ovaries.	Feb. 27, 1894.	Uterine appendages. Cystic enlargement both ovaries.	R	Good recovery.
131	Mrs. W. J. O.	Drs. Babcock and Pomeroy, Springfield, N. Y.	23 M	Diagnosis, doubtful as to nature cyst.	March 1, 1894.	Multilocular cyst, left ovary. Right ovary enlarged with pyosalpinx. Many adhesions.	R	Good recovery. Patient on returning home had much pain, relapsing into former morphine habit.
132	Miss S. N.	Dr. McCulloch, Gloversville, N. Y.	29 S	Pelvic peritonitis. Chronic disease left ovary. Severe dysmenorrhœa.	March 19, 1894.	Uterine appendages. Many adhesions.	R	Excellent recovery.
133	Mrs. L. D.	Dr. Johnson, Amsterdam, N. Y.	29 M	Double pyosalpinx.	March 23, 1894.	Uterine appendages.	R	Excellent recovery.
134	Miss J. McC.	Dr. Mosher, Granville, N. Y.	27 S	Double pyosalpinx.	March 30, 1894.	Uterine appendages. Many adhesions.	R	Excellent recovery.
135	Mrs. H. A. L.	Dr. Nichols, Sand Lake, N. Y.	43 W	Pelvic peritonitis retroversion. Diseased ovaries.	March 30, 1894.	Uterine appendages. Many, very firm adhesions.	D	Death from peritonitis. Patient very stubborn and hard to manage.
136	Miss J. K.	Dr. Lee, Canaan, Conn.	33 S	Hystero-epilepsy. Chronic ovaritis.	April 16, 1894.	Uterine appendages. Not difficult.	R	Speedy recovery. At end of third month no return of epileptic seizures.
137	Mrs. M. S.	Dr. Shaw, Hoosick Falls, N. Y.	25 M	Double pyosalpinx. Enlarged ovaries.	April 17, 1894.	Uterine appendages. Many adhesions. 7 qts. fluid.	R	Excellent recovery.
138	Miss L. S.	Dr. Garnsey, Kinderhook, N. Y.	31 S	Double pyosalpinx. Enlarged ovaries. Possibly tubercular appendicitis.	April 28, 1894.	Uterine appendages and appendix. Few adhesions.	R	Excellent recovery.
139	Mrs. F. F.	Dr. Melick, Sandy Hill, N. Y.	36 M	Double pyosalpinx. Pelvic peritonitis.	April 30, 1894.	Uterine appendages. Few adhesions.	R	Good result. Patient improved very markedly 3 months after operation.

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HOWARD VAN RENSSELAER, PH. B., M. D., EDITOR.

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ANNOTATIONS.

TRACHEOTOMY AND ANTITOXINE.

THE REPORT OF A CASE BY DR. J. L. ARCHAMBAULT, 56
CONGRESS STREET, COHOES, N. Y.

Saturday, May 18, I was called by Dr. Bell to perform tracheotomy on Frances Jones, a two years and three months' old girl. The child was suffocating with croup, and investigation proved the case to be one of diphtheria, most severe; large patch over left tonsil, another patch lining epiglottis and the whole left half of glottis entrance, besides numerous spots all through pharynx and excoriated condition of nares from sanious discharge running out from both. The child had been sick six to seven days, had shown symptoms of thorax-recession (*tirage*) during the previous thirty-six hours; the evening before had coughed out two good-sized pieces of membrane, which had given temporary relief to breathing; was now getting rapidly asphyxiated; lips and nails cyanotic; no vesicular murmur over both lungs, (*tirage*) thorax-recession extreme, although sensorium yet very clear.

At 3.40 p. m., tracheotomy. A large membrane flaps through opening and is dislodged with forceps prior to

inserting canula. Half an hour later, injection of 10 ccm. of Gibier's Antitoxine. May 19, 9 a. m., seventeen hours after first injection, second injection of serum, 8 ccm.; at 9 p. m., third injection of 7 ccm.—in all, 25 ccm. May 20, 9 a. m., membranes had almost all disappeared. Child was very bright and playful. May 21, 9 a. m., throat clear, clean and rosy. Canula removed, but reinserted at 6 p. m., as a matter of security, although child had articulated words and spoken loud. May 22, 9 a. m., canula removed for good, three days and seventeen hours after operation—while in all of my former tracheotomies the soonest it ever was removed was on the fifth day, and in a child four years old. Temperature taken an hour after first injection, at 5 p. m., was 100; at 9 p. m., 102.6; at 12 night, 101.2. On second day, after second injection, 100.4; after third, 102. On third day it became normal and remained so.

The injections were made in the side of the abdomen, three or four inches below the ribs, were followed by some slight tenderness, but no induration. On third day, appearance of erythema about the trunk.

Bacteriological examination of part of membrane dislodged from wound while operating, made at the laboratory of the Albany Medical College by Dr. MacFarlane, who reported presence of the Klebs-Loeffler bacilli.

The points worthy of comment in this case are: The child is the youngest I operated on, the one that needed the canula the shortest time, in fact, the one that got along the best of any of my cases; under no form of treatment did I ever see membranes so abundant and so thick disappear so quickly; they really melted, vanished away.

COHOES, N. Y., May 25, 1895.

The Treatment of Infantile Diarrhoea.—In the *Journal de Clinique et de Therapeutique*, Dr. Richard Drews, of Hamburg (*N. Y. Medical Journal*, July 13, 1895) publishes his further experience with Tannigen, a derivative of Tannin, which remains insoluble in the stomach and gradu-

ally becomes dissolved in the intestines. He states that Muller has employed Tannigen in very small doses in chronic enteritis, dysentery, and tuberculous diarrhœa with very good results. In the majority of cases the number of stools had diminished and the discharges were rendered less liquid. Kunkler, of Bonn, has employed it in twenty-five cases of infantile diarrhœa with success. During the first few days he gave calomel and naphthaline at the same time, for the purpose of disinfecting the intestines. He recommends continuing the employment of Tannigen for several days after the catarrhal symptoms have disappeared, in order to prevent a return of the disease. The author himself has used Tannigen for a year in cases of various kinds of diarrhœa with good results. As the drug has no taste or smell, children take it willingly, and in no case, even in nursing infants, has it produced any unfavorable influence on the appetite or upon the functions of the stomach. In many forms of diarrhœa, he has employed it successfully without using any other antiseptic drug. The astringent properties of Tannigen diminish the secretion of the intestinal mucous membrane and regulate the hepatic and pancreatic secretion. It acts as an antiseptic upon the putrid masses in the intestines and destroys the bacilli.

Dr. Drews cites many examples to show the efficacy of the drug, and thinks that the conclusion may be drawn that it is an excellent remedy in various kinds of infantile diarrhœa owing to the astringent property of the tannin and its antiseptic action.

A Community Without Vaccination.—Dr. Kerr writing from Rabat, on the westerly shore of Morocco, states some facts that will serve to remind the anti-vaccinationists of England of the condition of their own country before the grand discovery of Jenner. Smallpox makes fearful havoc among the Moors, with whom Dr. Kerr has lived seven years. During an epidemic at Rabat, over one thousand persons died from that disease in the course of two months. Rabat is a

town on the Atlantic seaboard of Morocco, having a population of 26,000. Of the condition of the town during the epidemic, Dr. Kerr writes the following: "Often we felt it sickening when going through the streets to see young men and boys sitting at shop doors, flour mills, etc., covered with smallpox eruption, in every way facilitating the spread of the disease. Everyone thinks that it is impossible for him to escape smallpox, hence no precautions are taken. It is painfully sad to see so many people who have lost the sight of one eye, while many are blind altogether. One day not long ago, I paid a passing visit to a douar, or a collection of tents, outside the city, and it was touching to see the mothers bring their children, asking me to put the medicine in their arms to prevent the infection. I vaccinated all the children in the village, and, although they were surrounded by smallpox, none took it."

These conditions, given by Dr. Kerr as to the Africa of to-day, are a simple repetition of what existed in Europe and England before Jenner's great boon to mankind was made possible.—*Journal of the American Medical Association.*

Plaster-of-Paris Bandage—To Remove Easily.—In *La Semaine Medicale*, No. 3, 1895, L. Gigli recommends a plan to facilitate the disagreeable task of removing a plaster-of-paris bandage, which is worth considering. After applying the usual layer of cotton around the limb a layer of parchment paper previously moistened and wrung out is wrapped above this and then a large sized cord well rubbed with vaseline is placed upon this in the direction that one wishes to saw open the apparatus. Over this the plaster bandage is laid on. When, in the course of time, the dressing is to be removed, this cord, whose ends have been tied together, is loosened and one end tied to a thin steel wire which has been nicked at close and regular intervals and the wire drawn through. Each end of this wire is attached to a handle and with a backward and forward motion the plaster is at once sawed through, after which the dressing may be immediately laid off.

REVIEWS AND BOOK NOTICES.

Practical Dietetics, with Special Reference to Diet in Disease. By W. Gilman Thompson, M. D., Professor of Materia Medica, Therapeutics, and Clinical Medicine in the University of the City of New York, Visiting Physician to the Presbyterian and Bellevue Hospitals. New York, D. Appleton & Company. 1895.

Very few books on general medicine describe fully or accurately what the best foods are, for each of the individual diseases of which the book treats. The same may be said of general works on therapeutics.

Yet the proper regulation of the dietary in many diseases is as valuable, and in some affections of more importance even, than the medicinal treatment.

To supply the need of a scientific and authoritative exposition of food stuffs in their chemical, economic and practical standpoints, this work was undertaken.

The book, which is a large one, containing about eight hundred pages, has in it exact information on every topic of practical dietetics that the practising physician would care to know.

An idea of the great variety of subjects covered may be gained from the fact that the table of contents occupies fifteen pages, and the admirable index at the back of the book twenty pages.

The subject matter is presented in a clear and comprehensive manner and the book is a delightfully easy and interesting one to read, as well as being instructive.

It occupies a unique position among our text books and should be in the library of every intelligent physician.

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THE Albany Medical Annals

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ALBANY MEDICAL COLLEGE.

ADDRESS DELIVERED SEPTEMBER 24, 1895, AT THE OPENING
OF THE SIXTY-FIFTH SESSION.

BY WILLIS G. TUCKER, M. D.

Gentlemen:—

Standing in this place to-day I cannot be unmindful of the rapid flight of time, for twenty years ago on a similar occasion I stood here to address the class assembled at the opening of the forty-fifth lecture course. And this is the sixty-fifth, and during the intervening period many of those whom to-day we greet as new comers have begun their existence. How many of those who were present then have passed from us it would be a melancholy tale to recount, but of the faculty then existing the senior members are all gone, and only three remain upon our present roll, and if I should go back to the session when as a student, eight years before, I entered this school, and call the list of the faculty, not one of those then teaching would answer. March, McNaughton, Armsby, Quackenbush, Vander Poel, Pomfret, Lansing and Mosher, all are gone, and their names even are unknown to some of you, though they are indelibly imprinted upon the records of this school, where for many years they labored so earnestly and successfully.

But this is rather a time for pleasant greetings, anticipations and forecastings than for memorials, reminiscences and recountings, and while it may often be profitable to survey the past, and take to heart the lessons which its history may teach, I do not purpose so to occupy your time this morning. At least no further than may be necessary to call attention to the fact that the conditions which attend the study of medicine now, and the practice of medicine as well, are very different to those which existed twenty years ago. The medical degree was then, as now, conferred by the incorporated colleges of the state, but it carried with it the right to practice, and it was conferred without state regulation other than the original provisions of law contained in the charters of the schools. Candidates for degree were required to be of legal age, to have studied three years with a preceptor, and to have attended two courses of lectures, but the schools might admit whomsoever they pleased, and could regulate the length of their sessions, giving the two courses required by law within a single calendar year if they so wished, and they were the sole judges of the proficiency of their pupils and their competency to practice their profession.

Under this system of non-interference by the state the schools were private institutions with little or no responsibility to the public on the one hand, and receiving little or no aid or added dignity or authority from the state on the other. That abuses existed is not, I think, to be denied, though I am far from being one of those who hold that the public suffered greatly, or that, in our own state at least, they were either numerous or glaring. Charlatans, pretenders and mere mercenaries are to be found in all the professions, but their number has never been excessive in the ranks of medicine which have ever included a great majority of earnest and honest men who have given themselves to good works and unselfishly have labored to promote the public welfare. And so I should be a traducer of that profession in which, though not an active worker, I am proud to be

enrolled, did I admit that the older medical education was a farce, and that the schools were established and maintained to satisfy the unworthy ambition or pecuniary greed of those who founded and conducted them, as some flippant persons would have us believe. The schools of a quarter of a century ago served a good purpose in their day, as did those which preceded them, and when we survey the annals of American medicine and study the lives of the eminent men who made their way upward, often through poverty and discouragements, with few of the advantages which the students of to-day possess, we are not inclined to belittle their attainments nor deride the system of instruction which helped to make them what they were. For, after all is said, it is the antenatal stamp of character that chiefly determines what the record of a man's life shall be. No mistake is greater than to suppose that institutions can make men. Books, libraries, instructors, universities,—these are all externals, and without mental capacity, high aim and moral probity in the subject they can never create ability or genius, or make a man either learned, successful or good. And there is perhaps danger to-day that we shall attach undue value to these externals, and to mere scholarship as indicated by class standing, and that we shall carry the examination system to extremes in our schools and out of them, and judge men too exclusively by their ability to pass these ordeals, making too little allowance for natural capacity, originality, adaptability and resourcefulness, which contribute so largely to success in the real work of life. At all events any educational system which stifles originality; puts a curb upon inquiry, and inculcates conformity with existing opinions, customs or prejudices, is one-sided and illiberal, and not conducive to the healthy growth and expansion of the faculties. And the idea is gaining ground that some of our present methods in education result in turning out men bearing too plainly the mould-marks of particular institutions, and hampered by traditions and class prejudices, and that some of our examination systems, based largely upon methods pursued in

countries having very different customs, laws and institutions from our own, may, in the end, prove to be not well adapted to our own needs.

Now the modern method of medical education is very different from the old system to which reference has been made. In our own state, and in many of the states, our schools are controlled by various laws of comparatively recent enactment, and while some feel that there is perhaps danger of too much state interference, I think that, in the main, these laws have had a salutary effect. In our own state the student who desires to begin the study of medicine is required to show that he possesses a fair preliminary education, and thereafter he must attend a prescribed number of courses in a medical school registered as maintaining a satisfactory standard, after graduation from which he must pass an examination before a state board of medical examiners, and not till then is he licensed, and entitled to enter upon the practice of his profession. Under this regulation the schools have been stimulated to do more systematic and more thorough teaching; courses have been lengthened; additional facilities provided; laboratory and clinical work increased, and fewer incompetent men have probably been graduated. This I think, will be generally admitted, and it ought to be granted, even if we are not disposed to concede that the existing system is a perfect one. Large power is placed in the hands of the board of regents and our boards of examiners, and if it be abused or not wisely exercised disastrous results must follow. In some states the course pursued by examining and licensing boards has been such as to give rise to much dissatisfaction. They are alleged to have exceeded the authority conferred upon them by law in various ways, as in classifying the schools and discriminating unfairly between them, and in demanding a four year course, as the Colorado state board of medical examiners has done, without giving time for the colleges to meet the requirement. Some of these boards admit any candidate to an examination for license, whether in possession of a dip-

loma or not, which course must necessarily tend to discourage all attempts to better the schools and raise the standard of medical education, by placing the man who, by the aid of quiz-compends and cramming, has prepared himself to pass an examination, upon the same footing as one who has devoted years to preparatory and college work and hospital practice. Diplomas of foreign universities, sometimes more easily obtained than American degrees and conferring no right to practice in the country where issued, are in some cases rated above those of our own schools, and in other ways, it is asserted, that some of these boards have abused the powers conferred upon them by state legislatures. The methods by which the members of these boards are appointed are not in all cases such as to insure the selection of competent men, and in the preparation of the examination papers, conduct of the examinations, and the grading of the papers, the methods employed are by no means always satisfactory.

So far, in our own state, I think that the power conferred upon our examining boards has been wisely exercised, but this is by no means a guarantee that it will always continue to be so. A grave responsibility rests with them. The schools must adapt their instruction to the requirements of these boards, and though their members are not themselves teachers, nor necessarily experts in their particular departments, they do in fact dictate to teachers, who should be experts, what they must teach and how they must teach it. It may readily be seen that this may lead to instruction along certain lines, which may be called for by the examiners, to the exclusion of other matters deemed of greater importance by the teacher, or, in other words, to a process of cramming, the end in view being the passage of an examination rather than the best education of the pupil which should take precedence of all other considerations. And so, notwithstanding the fact that the results thus far obtained in this state have been in the main satisfactory to the profession and to the schools, I do not hesitate to say that the present system of examination and license is far from being a perfect one. But if it be

amended from time to time as may be found to be necessary, and if extremists in the profession do not demand too much from the state, so that the public shall come to regard our restrictive measures as a kind of trades-unionism, it will probably continue to do much good in the future. Those, therefore, who desire to see state supervision of our educational institutions, and of the practice of the professions, maintained should be reasonable and not demand the enactment of harsh or even apparently unjust measures, or the public will resent what may be deemed a too great interference with natural rights on the part of the state, and call for the repeal of such restrictive laws as now we have. In matters pertaining to medical reform we should not proceed too rapidly, nor on the assumption that all has been wrong in the past and is to be set right by legislation in the immediate future. In a country so large as ours, and with a population so rapidly increasing, we must not make too narrow the avenues which lead to the professions and other occupations, nor render it unnecessarily difficult for a man to gain access to them and prove his competency to follow them.

Matters pertaining to medical education and practice are, in this country, greatly complicated by our political subdivision into different states with different laws. In a few of the states any person may still call himself a physician and practice as such, while in others mere registration of a diploma suffices. But in a rapidly increasing number an examination must be passed by the holder of a diploma before a license to practice can be obtained. Much confusion and annoyance result from these varied requirements, for an act which is legal in one state may be punishable by fine or imprisonment in another. But the same confusion exists in all directions. Our marriage and divorce laws; interest, usury and excise laws; labor and health laws, as well as those relating to the practice of other professions than medicine, and the conduct of many trades, vary greatly in our different states, and it would seem that the public are at last beginning to appreciate the evil results of these conflict-

ing and unequal laws, and that there is a general desire for greater uniformity. During the past month the Congress of State Commissions on Uniformity of Law met at Detroit for the purpose of advancing what Senator Allison has termed "co-ordinate state legislation." Seventy-nine commissioners, representing twenty-six states, are members of this congress, the object of which is not to impair the authority of the states in their own affairs, but to obtain certain reforms along constitutional lines in matters of common inter-state interest.

This desire for more uniform and consistent legislation is also to be observed in the frequency with which laws which have operated successfully in one state are re-enacted in others, and in the influence exerted by national organizations and scientific associations the membership in which is not limited by geographical lines, in securing the adoption of practically uniform laws on various subjects and especially those relating to education and the public health, in many of the states. It is not to be expected that radical changes will soon be made in our national constitution nor in those of the states, but many of the results which those who favor centralization in a government like ours, and regard the clamor for states' rights as chiefly based upon mere provincialism or false ideas of political expediency, desire to accomplish, can be brought about by state legislation as soon as a public sentiment in favor of the measure advocated is created, and in this work our scientific bodies, using the word scientific in its broadest sense, of national scope, are playing, and are destined in the future to continue to play, an important part. The influence which the medical men of this country may exert if they are united in favoring a project, and so organized that they can speak as a unit, is incalculable. That in our own state the profession should have been divided on an issue of no real importance, and that our national organization fails to receive the support of medical men in all sections, is greatly to be deplored, but physicians as a class are becoming more liberal, and they are less sensitive and less jealous, than they were in former days, and they are more ready to co-operate

with each other, and with the public, for the advancement of reform measures than they used to be in the past. And I have confidence that from out the present confusion of our diverse medical laws will be evolved some equable and rational system of state supervision, which will in time be adopted by the different states, and that this result will be brought about by the concerted action of medical men. Recent conferences of state medical examining and licensing boards which have been held, and at which representatives from many states and from Canada, have been present, indicate that the desire for co-operation and concerted action already exists, and the recommendations of such conferences, though perhaps binding upon no one, are sure to receive respectful consideration when presented as the best judgment of experienced officials. There ought to be state supervision, but it must be such as will best promote the public interests, and it must not be dictated by narrow partisanship.

And the state in turn should recognize the obligations which it has incurred in limiting the privileges and increasing the responsibilities of medical men. It may be urged with reason that it should furnish more direct assistance in the work of medical education and preparatory training. On this point opinions will differ, but at all events it should, as far as possible, aid in the work of medical education by securing proper distribution of anatomical material; by removing all the unnecessary restrictions which have been placed upon the study of anatomy and physiology by fanatical extremists, and by making state asylums and kindred institutions, so far as possible, helpful to teachers, and useful to those engaged in the study of medicine. The state demands many services from physicians which must often be rendered at considerable expenditure of time and of trouble, and at the risk of heavy penalties for non-compliance, and for all such services adequate pecuniary return should be made. Medical experts should be better paid, and protected from unjust assaults by counsel, and physicians should be insured fairer treatment than they often receive at the hands of ignorant juries in

actions which are brought for malpractice, frequently by wholly irresponsible persons for purposes of blackmail. In these, and in many other directions, the state is morally bound to recognize its obligations to the medical profession upon which it is, year by year, in many ways, increasing its demands. There has existed in the past a notion that the physician's calling, like the minister's, is essentially different from other pursuits, and that the public has a right to demand from him services, in the name of humanity, without remuneration and often without recognition of any kind. In many foreign countries even his regular fee for ordinary professional services is regarded as an honorarium, and he is generally expected freely to give his time to the poor and to serve the public in a great variety of ways without compensation. Many practices like suing for debt, advertising, and the taking out of patents, which in all other callings are regarded as ordinary business procedures and entirely legitimate, are deemed 'unprofessional' on the part of the physician, and thus a kind of sentimental glamour is cast about his calling which, from the practical point of view, often proves most detrimental to his interests.

It is time that much of this antiquated nonsense should be done away with entirely, and in his relations to the state especially, the physician may well make a stand and take the ground that for all services rendered by him to state institutions and upon state boards, and, in the broadest sense, in all cases in which he is called upon to give to the public the knowledge which is his capital he should be directly and adequately compensated. Doubtless the physician's calling is one in which appeals are more frequently made upon the sympathies by the suffering and the destitute than in any other, and it presents constant opportunity for the exercise of generosity and the performance of charitable deeds, but the voluntary bestowal of services or of alms is one thing, and the giving of a service without return because demanded by law or custom, both based upon an ancient notion of duty or decorum, is quite

another, and the physician will do well to assert his independence and claim the rights which he undoubtedly possesses. His professional fees, which are by some scarcely regarded as constituting a real debt, are in many instances entirely inadequate as compensation for the service rendered. Few physicians charge even their wealthiest patients as much for saving a life, correcting a deformity or restoring vision, as a lawyer would demand for advice and services in a matter of vastly less real importance, and yet the latter is cheerfully paid fees which if demanded by a physician would be deemed excessive if not extortionate. It is time that this matter received the attention it deserved, and that the public held more rational opinions on a subject so important to medical men.

During its last session the legislature made important changes in some of the medical laws. Chapter 661 of the Laws of 1893, providing for the preliminary education of medical students, has been amended by raising the requirements essential to obtaining the medical student certificate, and requiring that this be earned, though not necessarily obtained, three years before graduation. Under the law as amended, students entering colleges in this state this fall, and expecting to be graduated in 1898, must, at the least, have passed regents' examinations representing one year of academic work, while those expecting to receive diplomas in 1899 and 1900 must pass examinations representing two years of academic work, and a full high school course, respectively. As heretofore, graduates of registered academies, high schools and colleges; those who have completed one full year of college work, and holders of regents' diplomas, and of various foreign credentials, are exempted from examination and entitled to the certificate. With the exception of students matriculated prior to May 9, 1893, who may still offer regents' pass cards for the six preliminary studies and any ten academic counts, and those matriculated before May 13, 1895, when the present law took effect, who may offer pass cards for the seven original subjects, or any

thirty-six academic counts, all students entering upon the study of medicine must comply with the new law, but it will be observed that the standard is gradually raised and has not been set very high. The *important* change in the law, which has already caused more or less confusion and which will probably prove a real hardship in some cases this fall, is that which requires the medical student certificate to be earned three years before graduation. Under the old law this certificate might be obtained during or prior to the first year of study within the state, so that the student who began study with a preceptor in the spring had until the close of his first college year to obtain the certificate, and students coming into the state from other states had the same privilege, but this provision, at first sight apparently equitable, was soon seen to discriminate unfairly against residents of the state, for more was required of them than of non-residents who might take their first, or first and second courses of lectures at outside colleges, or even be graduated therefrom, and satisfy the requirements as to preliminary education afterward, whereas residents of the state must of necessity satisfy these requirements during their first year of study or abandon their medical studies until such time as they earned or obtained the certificate.

Obviously this was an unfair discrimination and tended to drive students from the state, and to remedy this difficulty the law has been so amended that the certificate must now be earned by all persons graduated in this state three years before the date of the degree. Since, however, the present amendment took effect without real notice to those who entered upon their study this spring, the regents have wisely decided to construe the law this year as leniently as possible, and have admitted to the September examination those students, not already in possession of credentials entitling them to the medical student certificate, who desire to take their first course of lectures this season with the expectation of being graduated in 1898. Those who fail to secure the certificate

will, of necessity, have to postpone their studies for another year. It might perhaps have been better had the law required the certificate to be obtained prior to beginning the first lecture course, instead of three years prior to graduation, for although the legal requirement for years has been that a student shall pursue the study of medicine with a preceptor for three years before graduation, the precise date at which such study is entered upon is seldom accurately noted and the really fixed point generally is the date of college matriculation. It will be necessary hereafter for those who expect to study medicine, and are not in possession of credentials which can be accepted in place of an examination, to secure the medical student certificate from the regents in good season, and not less than three years before the date of their expected graduation, since failure to do so will render them ineligible as candidates for the medical degree. It is also to be observed that medical student certificates issued in the past, and on the old and lower standard, are no longer valid unless those holding the same were duly matriculated before the adoption of the present amendment. This will probably cause disappointment and annoyance in some cases, and it is difficult to see how students possessing the minimum requirement who enter college this fall, or next, and for any reason fail to receive their diploma at the end of their third course can, under the present law, be eligible to graduation the year thereafter, since the requirement will then be higher and must have been satisfied three years before graduation. During the transition period in which the standard is to be gradually raised the present law, if unamended, is sure to cause considerable confusion and to work injustice in some cases.

The legal requirements for license to practice in this state as they now stand, in one respect at least, operate to the disadvantage of residents of the state who have been graduated from New York state schools, since these must have completed their preliminary education and obtained a certificate at a stated time, whereas non-residents, holding foreign

diplomas conferred without such certificate, may make up this deficiency at a later date, and then have the same standing before the examining boards as do residents who have complied with a more stringent regulation. But the number of persons so benefited is comparatively small, and when the difficulty of framing laws of this kind which shall be perfectly equitable is considered, we are inclined rather to commend those we have than to criticise them because they are not faultless.* They are certainly based upon correct principles, namely, that uneducated persons are unfit to enter upon the study of medicine and that incompetent persons are unfit to practice it, and the effect of the enforcement of these laws has been to raise the standard of medical education in the state. If, therefore, we are interested in the cause of higher medical education we should give them our hearty support, endeavoring to remedy such deficiencies as may exist that they may the better fulfill the purposes for which they have been designed.

During recent years many new subjects have been added to the medical curriculum, but these naturally form a part of some one of the seven departments which have long been regarded as natural and convenient subdivisions of the course. Anatomy, physiology, materia-medica and chemistry constitute the foundation upon which the superstructure rests and are the subjects which first receive attention, and of these materia-medica is generally regarded as dry; anatomy as hard, but essential; physiology as interesting and practical, and chemistry as a sort of bugbear with no very immediate relation to the practical branches. The majority of students, and a great many practitioners, regard it as a separate science, like botany or geology, which may be very useful as part of a general education, but which can so seldom prove helpful to the physician that the time spent in its

* Although apparently not expressly required by law, the regents have given notice, since the above was written, that hereafter, under the advice of the attorney-general, no applicant for license to practice, from any state, who had not matriculated in a registered medical school before May 13, 1895, will be admitted to examination "unless he met the standard in point of preliminary education three years before the date of his medical degree."

study is quite out of proportion to its practical value. If, therefore, no knowledge of this science has been acquired before medical study is entered upon the student is apt to grudge the time which he is required to devote to it and which, he is prone to think, might better be given to more essential branches. And if, on the other hand, he has done some work in chemistry at school or college, he is disinclined to recommence its study and devote time to medical chemistry, so-called, and in either case there is very generally the feeling that if he can do just enough to pass his final and get rid of the subject he has done all that can be required of him, and thereafter he feels no small satisfaction in having it off his hands during the remainder of his course. An experience of many years in teaching chemistry justifies me in saying that this is no over-statement of the case, though it is very hard to see why it should be so at present when the science of chemistry has proved of such value in medicine and is in reality most intimately connected with many essential branches.

But traditions in medicine are long-lived and hard to overcome and because in the olden days chemistry, as taught in the lecture room exclusively, was of small value to the general practitioner, the idea that it is so still continues to be transmitted, and the student is prejudiced against it much to his real disadvantage. If we go back far enough we shall, of course, find that medicine and alchemy were so intimately related as to be hardly separable. In the eighth century the Arabians pursued alchemy mainly in the search for medicinal agents, and the chief object of the work of Geber, who has been called the "Father of Chemistry," was the discovery of the philosopher's stone, by which some students conceive that he meant, not an agent for transmuting base metals into gold, but a medicinal substance. His writings show that he was continually experimenting upon the properties of the new compounds which he discovered with a view to using them as remedies, and through the succeeding centuries the search for the *elixir vitæ*, that

universal medicine which should cure all diseases and indefinitely prolong life, was diligently prosecuted. Indeed with Paracelsus chemistry became a mere adjunct to medicine, and Van Helmont, Glauber and their followers were both chemists and physicians. Toward the close of the seventeenth century, however, and in the hands of such men as Stahl and Boerhaave, the study of chemistry was more legitimately pursued and with higher aims, and during the last century Black, Cavendish, Priestley, Scheele and Lavoisier, and later, Berthollet, Dalton, Gay Lussac, Davy and Berzelius separated the wheat from the chaff and established the science of modern chemistry, which, though helpful to medicine was divorced from it, and independently pursued as a subject of study. And medicine, by this time largely freed from the mysticism and superstitions of the past, gained more than it lost by this separation, and began to take rank as a science, but the physician never ceased to receive aid from the chemist, though both gained by the separation of the sciences which naturally took place as knowledge advanced.

The connection then between chemistry and medicine has been intimate in the past, and they are intimately related to each other to-day, and yet many medical students believe that one is not essential to the other, and this pernicious notion greatly interferes with the successful study of the elementary branches, for it is often the case that the student discovers too late how much he has lost by neglecting to take advantage of the means at his disposal for gaining a knowledge of so useful a subject, and ever after regrets that he was satisfied with mediocrity where he should have striven to excel.

Allow me then very briefly to point out, and chiefly for the benefit of those now entering upon their course who begin it without knowledge of the subject, some of the reasons why the study of chemistry should not be slighted. And I will not take time to emphasize the very practical fact that immediate self-interest should prompt to its study

because it is required prior to graduation, and because a knowledge of the science is demanded by law in this state and deemed as important by our boards of medical examiners, as an essential requisite to license, as a knowledge of pathology or therapeutics. But that there may be no misunderstanding on this point, let me say that however lenient medical colleges may be, no man can hope to obtain a license to practice in this state, under our present law, who cannot pass as creditable an examination in chemistry as in the other six departments. Failure in this branch counts as heavily as in any other, and it is a mistaken kindness for any faculty to graduate a candidate who is deficient in this respect, no matter how brilliant his record may have been in his other studies. The time has passed, in this state at least, when this can be done with justice to the student, and with our present graded courses it should not be forgotten that a subject which is slighted one year is generally very difficult to make up thereafter. Hence the vital necessity for neglecting nothing since attempts to make up for present deficiencies by subsequent exertion must of necessity be attended with many difficulties and will very often result in failure.

And, first, observe that of the work of the first year, something of physics or natural philosophy should constitute a part, unless such knowledge has been required at entrance, and that in the study of this subject, and more particularly in such departments as electricity, some knowledge of chemistry is essential. *Materia-medica* discusses the composition of medicinal agents and deals with their chemical components, and in the study of pharmacology, as now pursued, the chemical constituents of medicinal agents are precisely stated, and the chemical changes which they undergo in their passage through the organism are traced, and the products resulting from their decomposition are distinguished and sometimes measured, and the channels by which they are eliminated are pointed out. Physiology begins generally with a description of the proximate principles of the body,

and a consideration of their chemical composition and properties, and its study can never be intelligently nor profitably pursued unless the student at least understands the meaning of the chemical terms which he employs. How can such a subject as respiration be studied without a knowledge of the atmospheric constituents, or intestinal digestion without a knowledge of the nature of fats and sugars and such processes as saponification and the conversion of starch into dextrose, which are chemical in their nature. Even anatomy, so purely descriptive, can scarcely be entirely divorced from chemistry, for, if studied apart from physiology, we must learn something of the composition of such structures as bone.

And when we come to the second year studies, such as hygiene, how essential is a knowledge of chemistry to a correct understanding of such subjects as ventilation, disinfection, sewage treatment and disposal, water purification and supply, the use of antiseptics, the preservation and disposal of the dead, and kindred topics. And toxicology is another subject which is largely based upon chemistry, and although in these days it constitutes a special department of scientific work, and is largely relegated to experts, it is none the less expected that the physician will be acquainted with the nature and properties of the commoner poisons; their antidotes and tests by which their presence may be recognized, as well as with the symptoms to which they give rise, post-mortem appearances which they produce, and treatment by which their effects may be neutralized. The physician who is removed from competent druggists may suddenly have need for an arsenical antidote. If he possesses some knowledge of chemistry he can prepare it quickly in a number of ways from the materials in his medicine closet, but without this knowledge he must consult his books, when time is precious, and then proceed arbitrarily with the feeling of uncertainty which attends the first trial of a new process. And in the application of tests, there are many of a preliminary nature which may be made by the physician

with good results to the community and his own reputation. But all such work, even if not at all elaborate, must be based upon a general knowledge of the science, and not upon the special knowledge derived from a short course in medical chemistry, so-called, for there is no such thing as medical chemistry as separate from the general principles of the science. There may be compendiums with condensed tables, lists of tests, and rules of procedure, but it would be as reasonable to expect a man to run a locomotive properly because he has read a book upon the construction and operation of steam engines, as to look for chemical competency in one who has made use of these short-cuts to knowledge merely. I am far from asserting that in these days of rapidly extending inquiry and of specialization in science, the practicing physician can be expected to be an expert chemist or toxicologist as well. I am only urging the necessity for thoroughness in the study of those branches of science upon which the subdivisions of medicine rest in place of the cramming and making up of subjects for the sole purpose of passing an examination to which so many students resort. And I believe that none of these foundation branches is more essential, and yet none more apt to be slighted and superficially made up, than chemistry. It may be said that art is long and life is short; that at best but a little knowledge of so vast a subject can be acquired by the medical man, and that "a little knowledge is a dangerous thing," but a little knowledge on any subject is better than none and only dangerous when it is employed under the false pretense of being profound.

Did time permit I might go much further in stating the uses of chemistry in medicine, for nothing has been said of its relations to modern biological and pathological studies, or of clinical chemistry, so-called, or of the contributions which synthetic chemistry has made to therapeutics, but a consideration of these matters would lead to a discussion so extended that we cannot at this time pursue it. If I have impressed on the minds of those before me who are on the

threshold of their medical studies the real importance of this subject from the outset as a part of their medical curriculum I shall be satisfied.

The catalogue of the college which has been issued during the vacation has apprised you of some changes which have been made in our course. This course is now a strictly graded one, some subjects having been divided, and each confined to a single year. The amount of laboratory work has been increased, and the clinical courses multiplied, and it is our hope that the curriculum as now arranged, if diligently pursued, will furnish you with the knowledge you need intelligently and successfully to enter upon the practice of medicine.

Through the generosity of Mr. Matthew W. Bender of Albany, a hygienic laboratory, bearing his name, will soon be erected, and opened to the students of this college for instruction in bacteriology, pathological anatomy and kindred topics. Other improvements are contemplated and will be made from time to time as the needs of our departments require.

The Albany Medical College, under the wise guidance of its founders and of their successors who preceded us, has a long and creditable history, but past accomplishments and successes have little to do with present performances, and only excellence now can satisfy its alumni and the friends of higher medical education. To attain this high standard and maintain it is the aim of its present faculty, and in endeavoring to accomplish this result they bespeak the encouragement and the co-operation, more particularly of their own alumni, whose interests are indissolubly connected with those of their alma mater, to whom they owe their professional birth and in whose good reputation they naturally feel a justifiable pride.

Report of One Hundred and Forty-Five Operations Done for the Removal of Ovarian Tumors and Pathological Conditions Associated with the Ovaries and Uterine Appendages Only.

BY A. VANDER VEER, M. D.,
PROFESSOR OF DIDACTIC, ABDOMINAL AND CLINICAL SURGERY, ALBANY, N. Y.

CONTINUED FROM PAGE 347.

An abstract of this paper was read at the meeting of the American Association of Obstetricians and Gynecologists, Toronto, Canada, September 19th, 1894.

NO.	NAME.	PHYSICIAN AND RESIDENCE.	AGE, CIVIL CON.	DIAGNOSIS OF DISEASE.	DATE OF OPERATION.	NATURE OF OPERATION. REMOVAL.	RESULT.	REMARKS.
140	Mrs. E. V.	Dr. Starks, Chatham, N. Y.	30 M	Small interstitial fibroid uterus. Dysmenorrhoea.	May 12, 1894.	Uterine appendages.	R	Good recovery. No return of flow. Aug. 24, 1894, patient improved very decidedly.
141	Miss E. M. K.	Dr. Seymour, Troy, N. Y.	34 S	Ovarian cyst.	May 24, 1894.	Double ovarian dermoid cysts. Few adhesions.	R	Splendid recovery.
142	Mrs. L. D.	Dr. Paust, Schenectady, N. Y.	30 M	Double pyosalpinx. Chronic peritonitis.	May 29, 1894.	Uterine appendages.	R	Excellent recovery.
143	Mrs. A. G. W.	Drs. Reed and Church, Ontario, N. Y.	29 M	Double pyosalpinx.	May 30, 1894.	Uterine appendages.	R	Good recovery. Patient doing nicely when leaving private hospital.
144	Miss M. C. F.	Dr. Heenan, Albany, N. Y.	27 S	Unilocular ovarian cyst.	June 6, 1894.	Unilocular cyst, left ovary.	R	Excellent result. Patient had improved in health. Sept. 10, 1894, looking very much better.
145	Mrs. A. McN.	Dr. Bissell, Troy, N. Y.	40 M	Unilocular ovarian cyst.	June 16, 1894.	Unilocular cyst, left ovary. Short, broad pedicle. Hæmorrhage.	R	First ligature slipped requiring three additional ones. Pedicle then brought up and attached to lower end incision. Second week, portion sloughed, pedicle came away. Some phlebitis of left leg. Otherwise excellent recovery.

In presenttng somewhat brief, yet quite as full histories of those cases as space would permit,—and perhaps taking much more time to read than many will care to do,—it will be observed that occasionally one is omitted, and this is in consequence of notes having been mislaid, or the history not being sufficiently completed in my record book. It will be observed, however, that in the table a sufficient history is given to enable one to classify the cases without difficulty.

I am not unmindful that it would have been much more comforting to myself to have commenced this paper by reporting to you my successful cases; cases that have brought to me much encouragement in my work, meeting patients in improved health, and in receiving letters filled with gratitude and acknowledgement of recovery.

Regarding the preparation of patients, it seems to me quite difficult to establish a fixed line of action. I believe that, so far as possible, it is wise to carry out the preparations at home, before the patient enters upon hospital life. It is true that there are some cases very calm and not affected by the thought of entering the hospital, and yet there are many who are made somewhat nervous by being kept under observation too long away from home. I would like to emphasize somewhat the importance of regulating the bowels and proper attention to such diet as does not constipate previous to the time of operation. I also wish to say that I place much stress upon the importance of a careful examination of the urine.

Now that we understand so well the evil effects of the bacillus coli communis we should see that the intestinal tract is put in a good, sanitary condition. The previous habit of the patient as to the use of morphine or opium should be carefully observed, and is not a contra-indication to operation, but the same will necessarily be needed after, and without fear in giving as full doses as may be required to relieve pain.

As to the preparation of the room, I have long since done away with the use of the carbolic spray, having had a tiresome experience in that direction, and rely upon thorough cleanli-

ness, washing all wood-work, walls and floors with the bichloride solution.

A large proportion of these cases reported were operated upon in the amphitheatre of the Albany Hospital, and some in the presence of one hundred and fifty or more students. As to the length of the incision I can only say that my experience endorses all that Dr. Joseph Price has said in his admirable paper upon this subject. I have endeavored to make it as short as possible with safety.

As to the drainage tube, usually glass, it may be said that I have used it with greater freedom than most of the operators at the present time. I must be excused somewhat by reason of the anxiety I have experienced in immediate hemorrhage, in the two cases reported, and therefore, have felt that the tube wherever there was any possible fear of this occurring, or where the oozing was likely to be greater than the peritonæum could care for, was the safest procedure. I have employed it in thirty-nine cases, exclusive of the cases of tubercular peritonitis proper, and have not hesitated to leave it in as long as the gauze tent introduced through the calibre of the tube gave no disagreeable staining, removing it sometimes within six hours after the operation, and sometimes leaving it in from eight to ten days. Where left in this length of time have followed it with the rubber tube. I have invariably made use of the rubber dam and then employed the gauze packing instead of the syringe for removal of the accumulating fluid, and have found this procedure quite as comfortable to the patient, and to myself it has seemed better than the employment of the syringe. I may be mistaken, but I believe that this table of cases exhibits quite as many and as severe adhesions as present in the average run of cœliotomies. Of the whole number, twelve cases gave a record of previous tapplings, and only two or three had escaped adhesive inflammations.

Regarding the closure of the wound in the use of silk, however well prepared, I have had occasionally a stitch-hole abscess. For the past four years I have used silkworm-gut

exclusively, and have very seldom met with this condition, as the table will show. I desire to emphasize here that I know of no kind of operative surgery that requires such careful apposition of wound surfaces, bringing like tissue in connection with like, as in the abdominal incision. I have not made use of the different rows of sutures, still I am not unmindful of the valuable arguments presented in favor of this procedure.

As to the time of removing the stitches it is well if the superficial ones are removed at the end of the second day, or tenth day. They do no harm and certainly help to keep the abdominal incision in more perfect apposition.

In conditions of continued oozing from adhesions, and where the abdominal walls have been greatly stretched by size of the tumor, I must say that I have seen, in two of my cases, a most happy result, from folding the abdominal wall over on itself, having previously put in through and through sutures of silkworm-gut, taking them out at the end of forty-eight hours.

As to hernias resulting, as far as I have been able to learn, I know of but three cases, and in one instance this was plainly due to the carelessness of the patient in attempting too much heavy lifting within so short a time after the operation.

As to the dressing of the wound, I have uniformly employed the powdered iodoform, one part to three of starch, then the iodoform gauze, with the Gamgee pads and flannel bandage, doing the first dressing at the end of forty-eight hours, removing what is usually but soiled iodoform gauze, reapplying the second dressing and letting it remain until the wound is healed, except in cases where the drainage tube may have produced some soiling.

Out of this number of cases I can report only one where the Fallopian tubes were freed from adhesions, straightened—not removing the ovaries—and a good result followed.

It will be observed that my mortality list contains three cases in which a fatal intestinal obstruction was due to a coil of intestines becoming fastened to the stump of the pedicle.

For the past two years, in such cases, where the stump seemed to flatten out over the ligature, I have brought the peritoneal surfaces together with one, two or three interrupted sutures of very fine silk, and comfort myself with the belief that it has, perhaps, had some effect in obviating this unfortunate post-operative complication.

The annoying cases I have found, and somewhat disastrous, are those brought to me by the family physician desiring an immediate operation that day or the next morning, in order that he might return home, but anxious to see the operation. These cases are fortunately growing less and less, as members of the profession realize more and more the importance of preparatory treatment, and of the operator seeing the case long enough in advance to feel sure of his diagnosis and operative procedure. I wish to make an observation, and that is in reference to the serious cases that are likely to come from one particular practitioner, one who procrastinates and keeps the patient, either by medication or tapping, under his treatment as long as possible, and then suggests operative interference when all the chances are against the surgeon. My mortality list contains three of these cases from one practitioner. I do not wish to criticise, but would enter a plea that wherever an abdominal tumor presents, in the practice of any physician, that it becomes almost his duty to call in the aid of a surgical assistant, that the line of treatment may be agreed upon as early as possible. In the study of these cases I have been impressed in two or three by the very marked history given by the patient of the tumor having appeared on one side, and yet when the operation was reached, the pedicle and attachment was found on the other side.

As to the pulse and temperature, I am satisfied that the former is of far more importance than the taking of the latter. The heart's action plainly tells of serious trouble going on in the way of intestinal obstruction, or of either form of peritonitis. There are many conditions really non-essential as to the recovery of our patient, that will cause an increase in temperature apparently alarming. Any nerve strain, a visit from a

friend, the discharge of blood that occurs from the vagina after an operation, and which appears in quite a number of cases, will sometimes prostrate the patient mentally, in itself producing an increase of temperature, but is of no serious import as regards recovery.

In getting the histories of patients I have been much impressed with the number of cases having a family history of phthisis, or malignancy. Thirty-nine cases of this table gave a distinct history of phthisis, fifteen of cancer in some form, while fifty-seven gave a history of marked irregularity of menstruation, with dysmennorrhœa, many of them from beginning of the menstrual act.

Making a closer analysis of the table there were thirty-nine cases of ovarian cyst, multilocular, with five deaths; twenty-five cases of ovarian cyst, unilocular, with two deaths; three cases of double ovarian cyst, multilocular, with one death, two cases of multilocular cyst, complicated with pregnancy, with one death; two cases of double multilocular ovarian cyst, complicated with fibroid tumors; there were twenty-seven cases of double pyosalpinx, with one death; tubercular peritonitis, six cases; tubercular peritonitis, with removal of one or both ovaries, five cases; extra-uterine pregnancy, three cases, with one death; exploratory incision-relieving adhesions and straightening tube, one case; one double pyosalpinx and removal of appendix; removal of uterine appendages for uterine fibroid, one case, making a total percentage of mortality in 145 cases of eleven per cent. In making a closer analysis we find there were three deaths from peritonitis; two deaths from hemorrhage; three deaths from shock; three deaths from intestinal obstruction; one death from diabetes; three deaths from exhaustion; one death from puerperal septicæmia; one death from pulmonary infarction.

Among the cases of recovery there are a few thoroughly instructive. Cases XXXV and LIX constitute the same patient. The others are cases XXXVIII, XLI, XLIV, XLIX, LVIII, LXIII, XCVI, CVII, CXII, CXIV and CXL.

A word as to the time of patient's returning home after an operation. I do not believe that it is always the greatest wisdom to hurry a patient home with encouragement to go on with their household and other duties, and particularly is this true in cases of removal of uterine appendages, for pyosalpinx and such like conditions. They must be made to understand that all their unpleasant symptoms will not disappear at once. It takes months for them to recover, and they are sometimes greatly disappointed in their hopes not being promptly realized.

I have but one case to report of keen anxiety in the loss of a foreign substance in the peritoneal cavity, and that in case thirty-two, Mrs. J. V., where a small sponge became entangled in mesentery of the small intestines and gave great trouble in search for it. I am now exceedingly careful about having any very small sponges handed me.

I regret that more careful attention was not paid to the weight of tumors in the table, but part of this work was confided too much to advanced students and house surgeons, and not done thoroughly well.

Three cases give an interesting history of ligatures escaping through the sinus left by the drainage tube, the ligature in one case being of coarser silk than ought to have been used. No ill effect followed, the sinus being closed as soon as the ligature was recovered. Possibly in one patient, case thirty-one, Mrs. E. H., it may have assisted in causing the hernia.

As to the after treatment I am most rigid in not allowing the patient the use of the hypodermic injection of morphia any more than is absolutely necessary, but prefer to give it where there is restlessness due to a weak heart's action, and where the pain is so great as to be intolerable.

For treatment of persisting vomiting I have seen excellent results from the combined administration of cocaine, calomel and oxalate of cerium, and then I can only endorse the use of calomel and salines for moving the bowels. A movement should be secured if necessary by the aid of injection, as early as the second and third day, not later than the fourth day

after the operation. As to diet, my patients have been greatly benefited by the carrying out of the hot water treatment, and the use of matzoon, particularly if the stomach is at all nauseated; also, for relief of thirst, rectal injections of hot water, slightly saline.

In Memoriam.

FRANKLIN TOWNSEND, JR., M. D.

At a special meeting of the Albany County Medical Society, held in Alumni Hall, Friday evening, November 1st, 1895, to take action on the death of Dr. Franklin Townsend, Jr., the following resolutions were unanimously adopted:

Whereas, the news of Dr. Townsend's death has come to this society with a suddenness almost startling, they having anxiously hoped for his recovery to health and activity; and

Whereas, by his death the society recognizes a loss to its membership almost irreparable, not only by reason of his many virtues of mind and heart, but as well his commanding skill as a physician, and his signal ability as an executive officer: therefore be it

Resolved, That while the members most sincerely sympathize with his family and his friends in the severe loss they have sustained, they still gratefully remember that many years of Dr. Townsend's life were spent in the exercise of one of the best and highest of human pursuits, and that his career was distinguished by notable skill, broad philanthropy and by honest and successful endeavors to uphold and advance the usefulness and dignity of his profession.

Resolved, That these resolutions be spread on the minutes of this society, and a copy thereof transmitted to the family of deceased.

J. P. Boyd,
J. D. Craig,

C. E. Blair,
J. V. Hennessy,

T. K. Perry,

Committee.

Memorial to the Memory of Franklin Townsend, Jr., M. D.

BY THE MEDICAL STAFF OF THE ALBANY HOSPITAL.

The Medical Staff of the Albany Hospital, through its Committee, desires to record its great loss in the death of Dr. Franklin Townsend, Jr.

It has always been a matter of just pride to the Staff that he was enrolled among its members.

Dr. Townsend, as a student, exhibited much enthusiasm for his work, and his maturer years showed him possessed to an unusual degree of the requisite resources of a well trained physician.

His great skill as a physician was given freely to the hospital and his time and counsel were always at the command of his professional brethren.

Personally he possessed the graces both of a charming disposition and a warm sympathetic heart, which endeared him to patients and associates alike.

By his death the Staff loses one whose zeal and attainments were a constant inspiration, whose co-operation was greatly valued and whose companionship was an unvaried pleasure.

He has left such a record of good work accomplished, of loyalty to the profession, and of tenderheartedness towards all, that his memory will be cherished by all who knew him, and especially by his collaborators of the Medical Staff of the Albany Hospital.

William H. Bailey, M. D., Chairman,
F. C. Curtis, M. D.

Howard Van Rensselaer, M. D.

AMOS FOWLER, M. D.

The Medical Society of the County of Albany desires to record its sense of the personal loss which comes to us all in the sudden bereavement of our esteemed associate, Dr. Amos Fowler. He was the oldest practicing physician in Albany, and, even after he had passed the natural period of human life in unwonted devotion to his chosen profession, his "eye

was not dim, neither was his natural force abated". He was a man of modest deportment and of untiring industry. He was an exemplary citizen, a most congenial companion, a faithful and skillful physician, and a courteous Christian gentleman. Therefore,

Resolved, That this tribute to the memory of Dr. Fowler be entered upon the minutes of the Society and published in the city papers, and that the Secretary send a copy, with expression of our sympathy, to the surviving family.

S. H. Freeman, M. D.

Joseph Lewi, M. D.

C. H. Porter, M. D.

Committee.

Trendelenburg's Method for Varicose Veins.—Trendelenburg's researches on the formation and growth of varicose veins in the lower limbs have shown that the trouble lies, not in the difficulty which the blood experiences in circulating in the veins, but in the pressure of the column of blood heaped up above—that is, in the saphenous vein, a column whose weight rests on the peripheral veins on account of the weak valves of the saphenous.

Trendelenburg's method-ligature of the saphenous at the upper part of the thigh is based on this theory. Kerthes, operating on forty-one cases, had thirty-two definite cures. He had some relapses, due to the vein becoming permeable again some time after the operation; consequently, the author recommends resection of a few centimeters of the vessel. The successes of this method are remarkable, not only for the effect they have on the disappearance of pain, but also for the improved local conditions. Varicose ulcers were notably ameliorated in a short time by ligature of the saphenous. This method appears worthy of adoption; its advantage over Madelung's method—extirpation of the varices—consists in the much greater facility with which it may be performed.—*The Journal*.

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On the Death of Franklin Townsend Jr., M. D.

In another column will be found some of the resolutions enacted to the memory of Dr. Franklin Townsend.

To the tribute of esteem and friendship which medical society has publicly accorded him, numerous private letters from his professional associates were also sent to the Secretary, each bearing the stamp of the personal loss to the writer.

While the limited size of the ANNALS makes it impossible to put in print these letters, and the eulogies that appeared in the public newspapers at the time, yet the ANNALS cannot let this opportunity pass without voicing its sorrow and sense of loss, not only of all his professional brethren in Albany, but also every one of his friends and acquaintances who knew him well.

Dr. Townsend, first of all, was an honorable high minded gentleman in its noblest sense; to this inborn qualification there was added a personality, gracious, attractive and winning, to all who came within the sphere of its influence.

And when we recall that as a physician, he brought to bear on the difficult problems of his profession, a mind of great intelligence, well educated and well trained, both at home and in Europe, and a spirit, enthusiastic and yet conservative, we cannot but realize how genuine is the sorrow and how great the loss, by his untimely death, to the community at large, and especially to his professional associates.

The Treatment of Infantile Diarrhoea.—In the *Journal de Clinique et de Therapeutique* Dr. Richard Drews of Hamburg (*N. Y. Medical Journal*, July 13, 1895) publishes his further experience with Tannigen, a derivative of Tannin, which remains insoluble in the stomach and gradually becomes dissolved in the intestines. He states that Muller has employed Tannigen in very small doses in chronic enteritis, dysentery, and tuberculous diarrhoea with very good results. In the majority of cases the number of stools was diminished and the discharges were rendered less liquid. Kunkler of Bonn has employed it in twenty-five cases of infantile diarrhoea with success. During the first few days he gave calomel and naphthaline at the same time, for the purpose of disinfecting the intestines. He recommends continuing the employment of Tannigen for several days after the catarrhal symptoms have disappeared in order to prevent a return of the disease. The author himself has used Tannigen for a year in cases of various kinds of diarrhoea with good results. As the drug has no taste nor smell, children take it willingly, and in no case, even in nursing infants, has it produced any unfavorable influence on the appetite or upon the functions of the stomach. In many forms of diarrhoea he has employed it successfully without using any other antiseptic drug. The astringent properties of Tannigen diminish the secretion of the intestinal mucous membrane and regulate the hepatic and pancreatic secretion. It acts as an antiseptic upon the putrid masses in the intestines and destroys the bacilli.

Dr. Drews cites many examples to show the efficacy of the drug and thinks that the conclusion may be drawn that it is an excellent remedy in various kinds of infantile diarrhoea, owing to the astringent property of the tannin and the antiseptic action.

REVIEWS AND BOOK NOTICES.

Kell's Medical, Pharmaceutical and Dental Directory.—George Keil, editor, Philadelphia, announces the early publication (fourth edition) of "Keil's Medical, Pharmaceutical and Dental Register-Directory and Intelligencer," for Penn-

sylvania, New Jersey, Maryland, Delaware and District of Columbia. Its list of National colleges, State hospitals, homes, dispensaries, societies, and post-office addresses of physicians, druggists and dentists, school of graduation and year, all the latest laws in these states, will be complete to date of issue as a personal canvas will be made for data. It is the only directory published for above named states, registering graduates of all schools, physicians, druggists and dentists, and imparting all information needed by the professions mentioned in their daily practice. No effort will be spared to make the directory complete, and the information accurate and reliable in the minutest detail belonging to the domain of medical, pharmaceutical and dental professions. An experience of thirty years is a sufficient guarantee that all subjects will be properly treated in KEIL'S DIRECTORY. The names in large cities, in addition to being in alphabetical order, will be numerically arranged by streets, also an alphabetical list of names of the whole directory, giving the page of each; these features will no doubt be appreciated.

The International Medical Annual.—E. B. Treat, publisher, New York, has in press for early publication the 1896 INTERNATIONAL MEDICAL ANNUAL, being the fourteenth yearly issue of this eminently useful work. Since the first issue of this one volume reference work, each year has witnessed marked improvements; and the prospectus of the forthcoming volume gives promise that it will surpass any of its predecessors. It will be the conjoint authorship of forty distinguished specialists selected from the most eminent physicians and surgeons of America, England and the Continent. It will contain reports of the progress of medical science at home and abroad, together with a large number of original articles and reviews on subjects with which the several authors are especially associated. In short, the design of the book is, while not neglecting the specialist, to bring the general practitioner into direct communication with those who are advancing the science of medicine, so he may be furnished with all that is worthy of preservation, as reliable aids in his daily work. Illustrations in black or colors will be consistently used wherever helpful in elucidating the text. Altogether it makes a most useful, if not absolutely indispensable investment for the medical practitioner. The price will remain the same as previous issues, \$2.75.

